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REGULARS

NEWS 6
Joysticks, games, software, it's all here in ACU's up-to-the-minute scout around the CPC scene.

LETTERS 10
The queries are coming in thick and fast and Ziggy's been rushed off his feet to sort them all out. Poor little soul.

10-LINERS 14
David Hall's back with some more of his epic proggies for your delectation. Try them, you'll enjoy them.

BASIC 18
Glynne Davies continues his expert probing into programming with a look at loops.

HAIRY HACKER 22
All the best from the land of Hack, to help you get to Hell...and back!

COMBAT ZONE 24
John Cook comes down off cloud nine from the land of Virtual Reality and explores some of the latest blasts in the arcades.

THE DUNGEON MASTER 28
DM takes time off from his amblings around Adventure Land to concentrate on the computer scene.

GAMEPLAN 33
Turrican makes a glorious comeback this month, with STUN Runner, Robocop, E-Swat and a host of other goodies hot on his heels.

COMMS 48
Mr Bates casts his beady little eye over a handy Ansi emulator this month, with spectacular results.

PD SCENE 54
More exciting news on the word processor and font front from our man about the PD libraries, Paul Tint.

LISTING 62
What have we got for you after our mammoth American Footie type-in? Tune in and find out. You won't be disappointed.

FEATURES

COMPETITION 12
Get yourself in the winning frame with ACU's superb Turrican giveaway.

CODE BREAK 27
Unicode software's new basic protection routine comes under scrutiny from the ACU team.

A REAL PLUS 44
Get to grips with CP/M+ with a brand new series about disc operating systems.

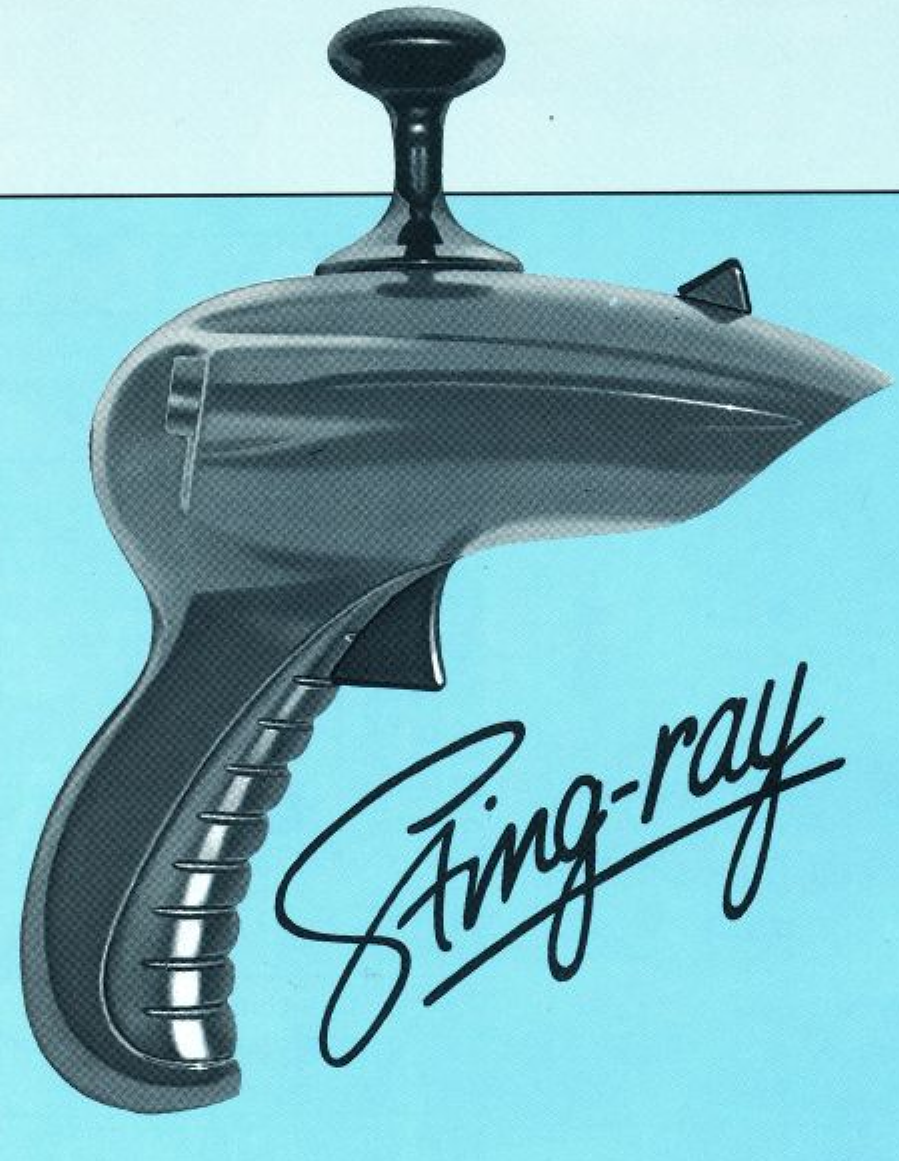
BITS 'N' PIECES 50
This is it. Your very own section for wants, don't wants, swaps and services. Just browse through the small ads to see what you're after.

PLAYING THE AMSTRAD 51
Join in as Ian Waugh moves onto the real sound of your CPC. Ah, I can hear it all now!

POWER BASIC 58
Convert your basic to machine code and still leave room for your games proggies. How? Andrew Banner shows you with the help of SPM Software's latest offering.

THE REAL THING 64
Vic Barnes takes a close look at how well simulations match up to the real thing. How do they compare? Find out inside.

THE STING



Spectravideo's latest British joystick firm has announced details of its newest state of the art zapping stick, the Sting Ray, and it sure looks the business.

Slightly reminiscent of the old Voyager hand stick, the Ray is designed to fit snugly into your palm, using durable microswitches for extended periods of alien blasting.

It's even designed for left or right hand grip so, should you eventually tire of zapping on one side, just switch and continue.

Spectravideo boss Ashvin Patel said of the new company, Logic 3,: "We see the firm as the BMW of the joystick world and the Sting Ray is the ultimate zapping machine."

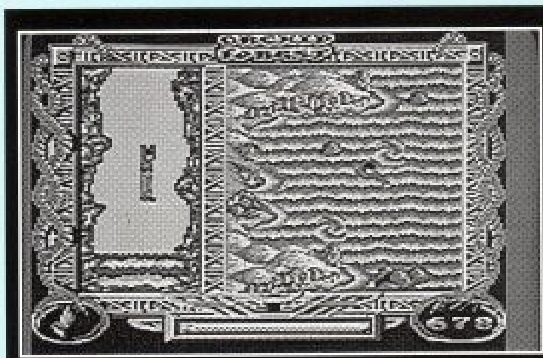
Selling for just £14.95, the stick is very competitively priced and, when we do our next joystick round-up in the near future, we'll see just how well it compares with the best of the rest.

DESIGN SUCCESS

Following on from the success of Chris Price's little black box-the Game-Pro joystick and pedal unit, his latest development has been to produce the stick for the CPC+ machines.

The stick, according to Chris, should also be available very soon in an analogue version, so keep your eyes open for that.

If you want to get hold of a catalogue from Chris, which also contains the first variable auto-fire unit for the CPC, send an A4 SAE straight away to Chris Price, CpRs Design Technology, 70 Potton Road, Eynesbury-Hardwicke, St.Neots, Cambs. PEl9 2NN, enclosing two first class stamps to cover the weight of the catalogue.

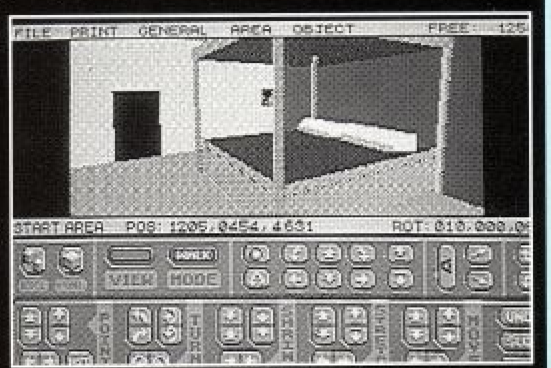


THE STORY GOES ON

The good news from Liechtenstein based Linel, is that the long-awaited sequel to The Never Ending Story could be out on the streets very, very soon, if it isn't already there as we go to press.

NES II follows the plot of the new film sequel very closely, with Bastian desperately trying to save Phantasia. With reportedly excellent graphics, the arcade game features six sub games to link in with the film plot and capture the atmosphere of the story.

Later on in the year, Linel plan to release an adventure game of the sequel though, at present, this is only planned for the 16-bit market. Come on Linel, don't be spoilsports, we want to play as well.



COLLECTOR'S CORNER

The Royal Mail has just announced the release of a set of stamps celebrating the bi-centenary of the birth of Charles Brabbage, the pioneer of computer science, alongside other top British inventors.

The special set will be available from March 5 and will include an image of Mr Brabbage and his machine on the 22p first class stamp.

So, if you're an ardent Philatelist, make sure you get down to your local Post Office to get your special set.

Alternatively, just answer this simple question and you could be the lucky winner of one of five sensational Presentation Packs to mark the release of the new stamps.

When was Charles Brabbage born?

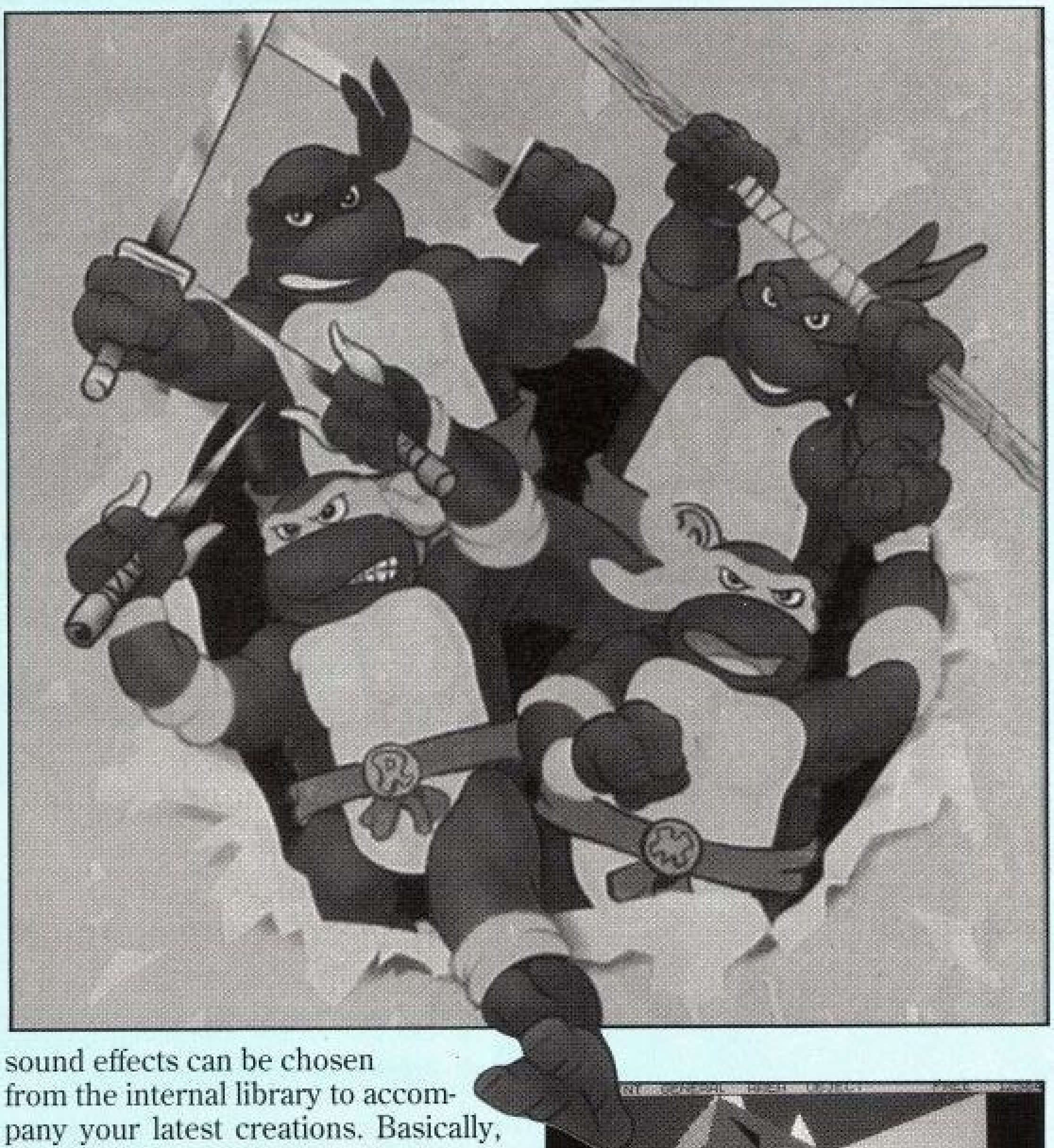
Send your answers to Brabbage, ACU, MSM Ltd., 116-120 Goswell Road, London ECIV 7QD and see if you can get hold of this exceptional offer.

SUBBING UP

Here we go with this month's list of the lucky MSM subscription winners. Without further ado, the top prize of £150 goes to T.Lewis of Ilford. Winners of the £50 runners up prizes are G.D.Holley of Taunton and R.Davis of Coventry.

Don't forget, whenever you renew your subscription with ACU, your name is automatically entered into our monthly prize draw and you can renew at any time by ringing 091 510 2290.

COMING UP TURTLES



Prizes, prizes and more prizes. This time it's the long-awaited result of the Teenage Mutant Hero Turtles competition. You know, the one where we were giving away an incredible video player AND turtles video.

Anyway, to put you out of your misery, the incredibly lucky winner is G.Ward of Fenham, Newcastle-Upon-Tyne, so there'll be some celebrations up in Geordie land about that.

Sorry you couldn't all be winners, but that's the way it crumbles, cookie-wise. Not to worry, 10 groovy turtles goody bags will be on their way to the runners up very shortly.

New Dimensions

Everybody who loved the 3D world of Castle Master, will be knocked out by Domark's latest development.

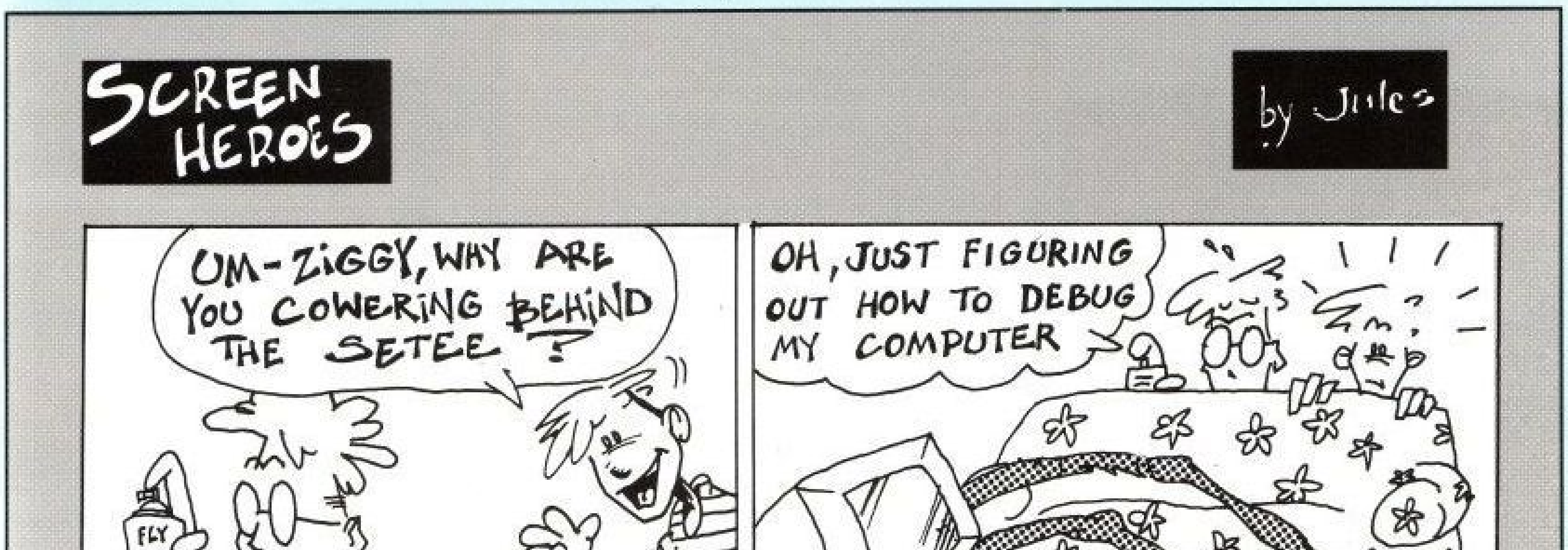
The 3D Construction Kit enables you to actually create your own world, using the same innovative Freescape technology that was used in Castle Master itself.

Easy to use, the Kit can be used for game creation, 3D modelling and even for educational study and design purposes.

Stand-alone environments are available if you're feeling lazy and special sound effects can be chosen from the internal library to accompany your latest creations. Basically, the Kit allows your imagination to run riot, to create a whole new world and people it with as many fascinating creatures as possible.



Coming out at the beginning of April, the 3D Construction Kit should be a must for all those who want to get ahead in game creating.



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- Simple plug in memory expansion gives instant extra memory.
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- Ideal for use with the CPM 2.2 etc.
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- On screen menu driven drum kit makes composing drum sounds easy for anyone to do!
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- Comes complete with DrumKit Sound plus extra DrumKit and Kit Editor Program (worth £9.99) absolutely FREE!!

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464 OR 6128 (Please state which)

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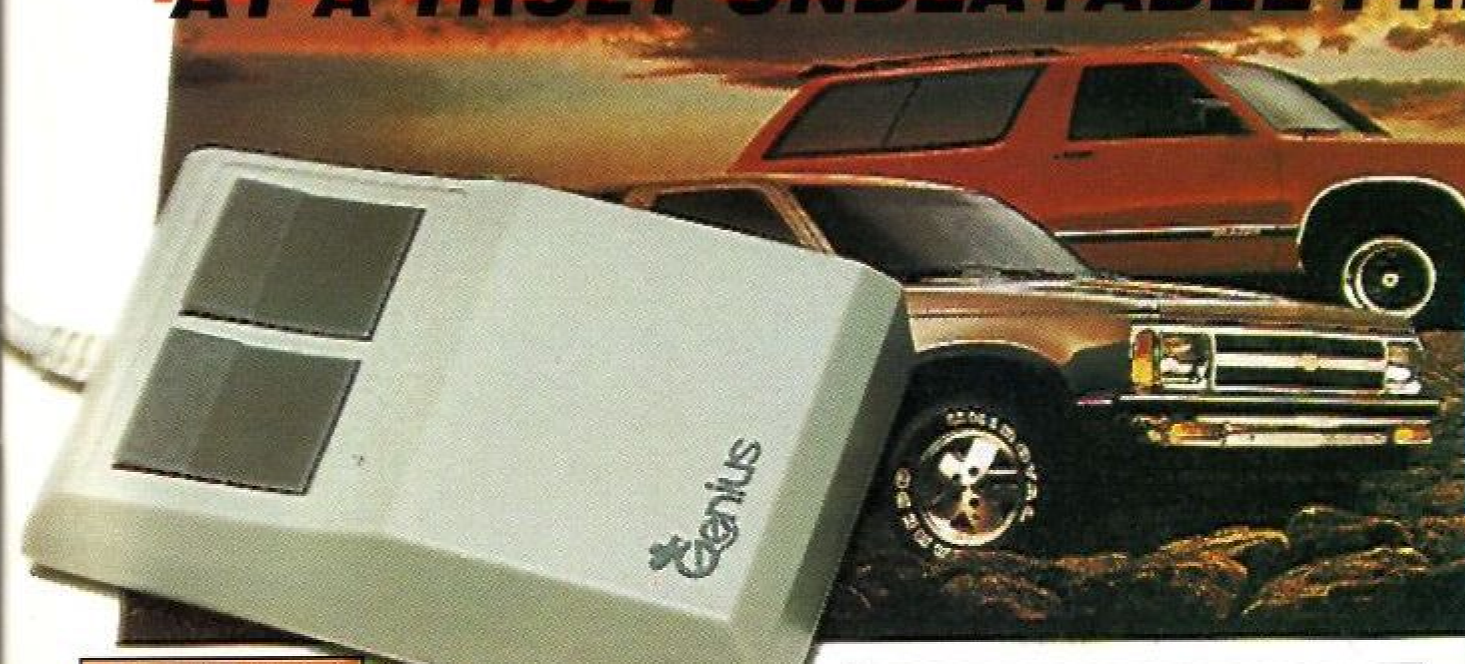
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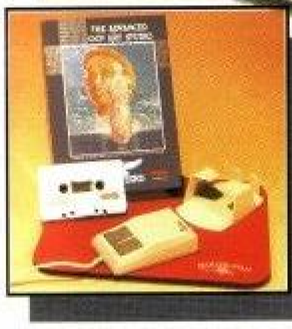
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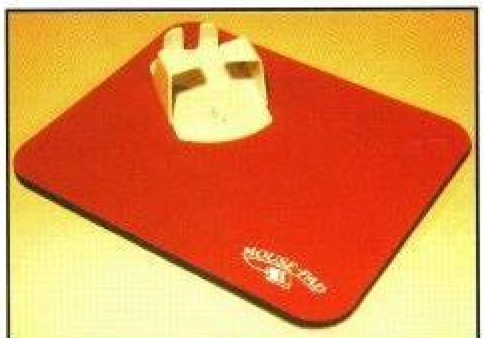




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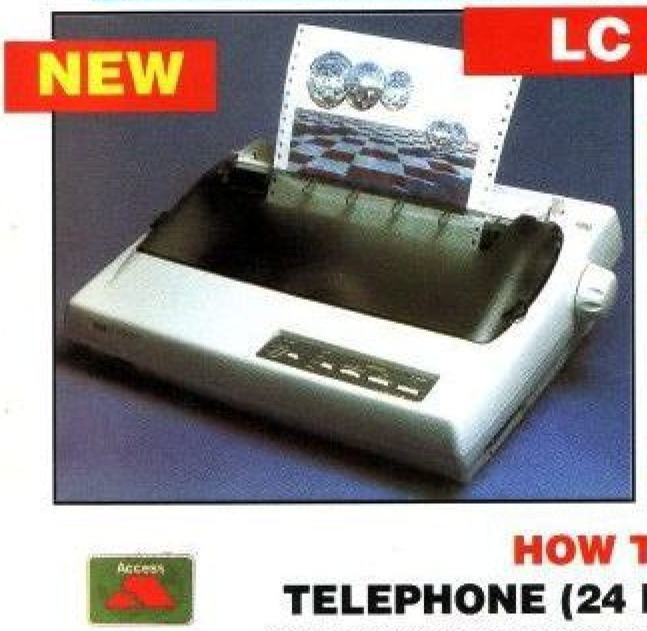


- The Genius Mouse Graphics System comes complete with the special Mouse Interface to allow super smooth control.
- Attractively styled to match your 464 or 6128 design and colour.
- Simply plugs into Expansion/Joystick port.

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NORMALLY £327.98
COMPLETE PACKAGE NOW ONLY £239.00

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ZIGGY'S MAILBOX

FIRMWARE BLUES

I have recently begun to learn machine code on the Maxam Amstrad Assembler. In their manual, they mention a certain book: 'An essential reference for machine code programming on the Amstrad CPC is the "Complete Firmware Specification", published by Amsoft'. I understand this book is something of a bible amongst machine coders as it contains vital information about the operation system routines.

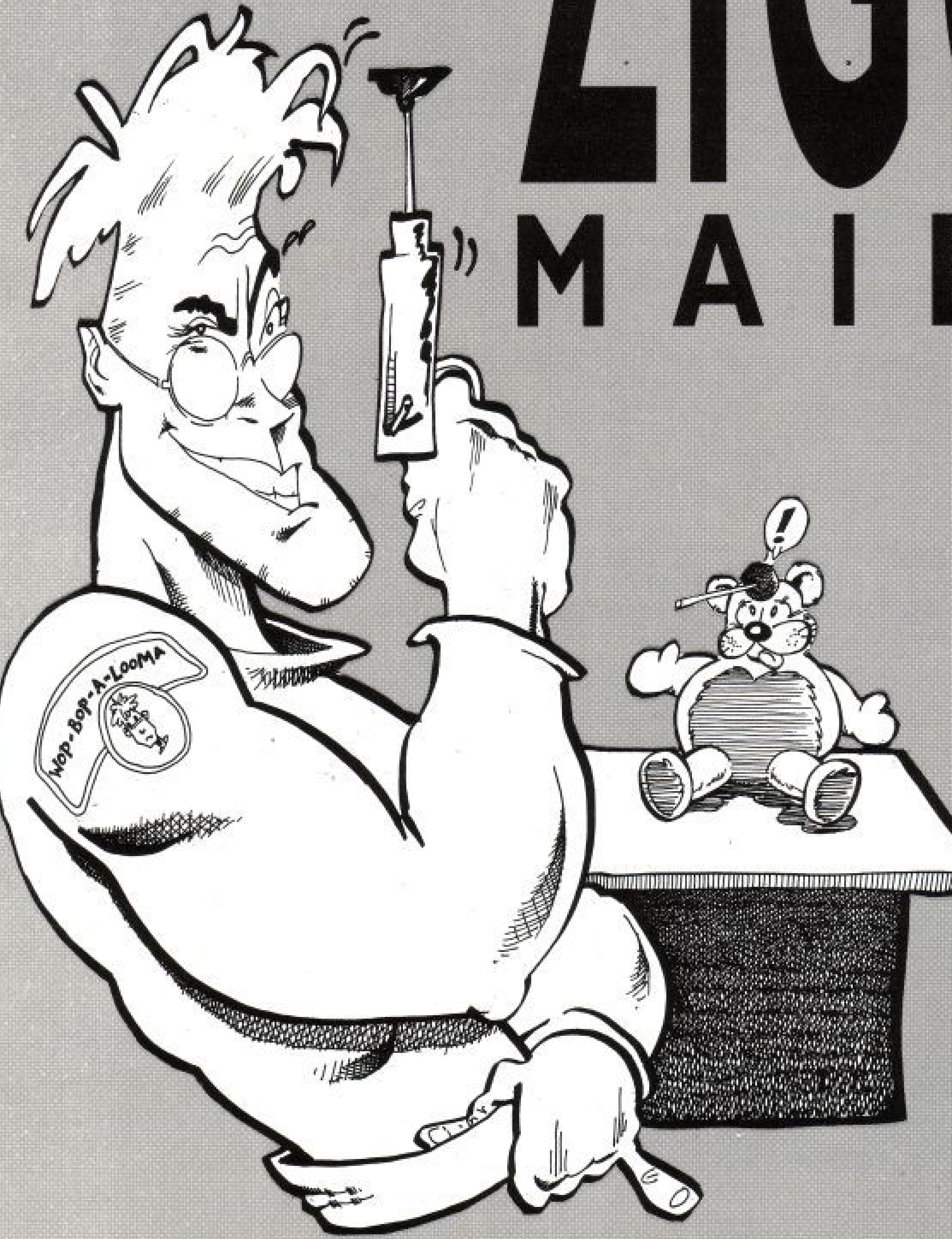
Does the book exist? My library has never heard of it and nor have any of the book shops. Was this title made up by Maxam during a raging Christmas party? I would be extremely grateful, and would renew my subscription many times over if a member of the greatest monthly literature masterpiece for CPCers, would tell me that this book is not a myth and give me its full title, publisher, author and, most importantly, the magic ISBN number, so I can rush out and buy several.

If you could oblige my requests, your readership would double overnight and blessings and goodwill would submerge your brilliant magazine, raising it up as the greatest publication on earth (actually it already is).

Neil Stewart, 11 Rosary Drive, Bridgewater, Somerset TA6 7JS.

Ziggy: Well, all that praise. I've gone all red and thoroughly undeserving too, as I'm afraid I can't find that book for you either. Locating that precious old firmware manual, which does indeed exist, has become like locating a needle in a haystack of late and it is certainly worth its weight in gold.

However, what I do suggest, is that you look through our Bits 'n' Pieces section this month, where I believe not one, but two of the little blighters are on offer. Otherwise, there must be a kind-hearted reader out there who can get in touch with Neil. Happy hunting.



A SPORTING PUZZLE

I own an Amstrad CPC 464 and I was wondering if you could tell me if a game called Sport of Kings from Mastertronic Games has been released on Amstrad. I recently played the game on a Spectrum and thoroughly enjoyed it so, could you tell me if it is available on Amstrad and where I could get hold of a copy?

Chris Higgins, 90 Hillport Avenue, Porthill. Newcastle.

Ziggy: Well Chris, I've checked with Virgin on that one and, unfortunately, the game is now no longer in stock. As to whether it was originally released on Amstrad, they aren't too sure anymore, so, it looks like our beloved readers could well be your last resort. If anyone out there remembers playing that horsey game, let Chris know.

SALE NEWS

I own a CPC 6128 and I've decided I want to sell it. I have one disc drive built in to the keyboard, colour monitor, tape deck, multiface II, over £500 worth of games, a couple of books, a manual and loadsa magazines (ACU).

Brand new, this lot would cost about £1000, but I will sell it for £350.

Stephen Clegg, Egloshayle Stores, Tower Nill, Nr. Wadebridge, Cornwall PL27 6HR.

Ziggy: Oh, alright, I'll let you get away with this one, but don't forget that we now have our brand new Bits 'n' Pieces section in ACU now, so if you want to sell your old goodies, though why I don't know, just fill in the coupon and send it back in.

In the meantime, Stephen looks to have quite a bargain there.

WHO'S WHO?

I am in the process of compiling a Who's Who of PD libraries, which I hope to have completed in the next few weeks.

If any of your readers run a PD library and would like to be included in this publication, which will only be updated every year, they should send details (up to 100 words) about the library, whether it claims to be the oldest, newest, largest or smallest, together with £5 registration fee, which really amounts to a year's advertising.

The directory will then be made available to anyone wishing to obtain a copy and should prove invaluable to all computer users.

If anyone else would like to have their services, wants, fanzines or needs included, they can do so with the same conditions applying . If you want to get into the Who's Who of PD, get in touch. But hurry!

R.Dillon, 70 Highfern Gardens, Belfast, BT13 3RE.

Ziggy: Good idea, Mr Dillon. Good luck with the project.

THANKS!

I hope you will print this letter in the next available space in ACU. It's to say a very big thank you to all the generous ACU'ers who replied to my plea for a few missing lines of 'Molecule'.

The response was tremendous; letters, print-outs, photocopies and even the loan of the complete magazine.

I'd like to thank each one personally, but the postage would cost a small fortune so perhaps this thank you on the Letters page will be best.

I had copies as far apart as Troon, Colerne, Twickenham and Chichester, to name but a few. So, thank you all again and thanks ACU for printing my letter in the first place.

R. Castle, Wirrel, Merseyside.

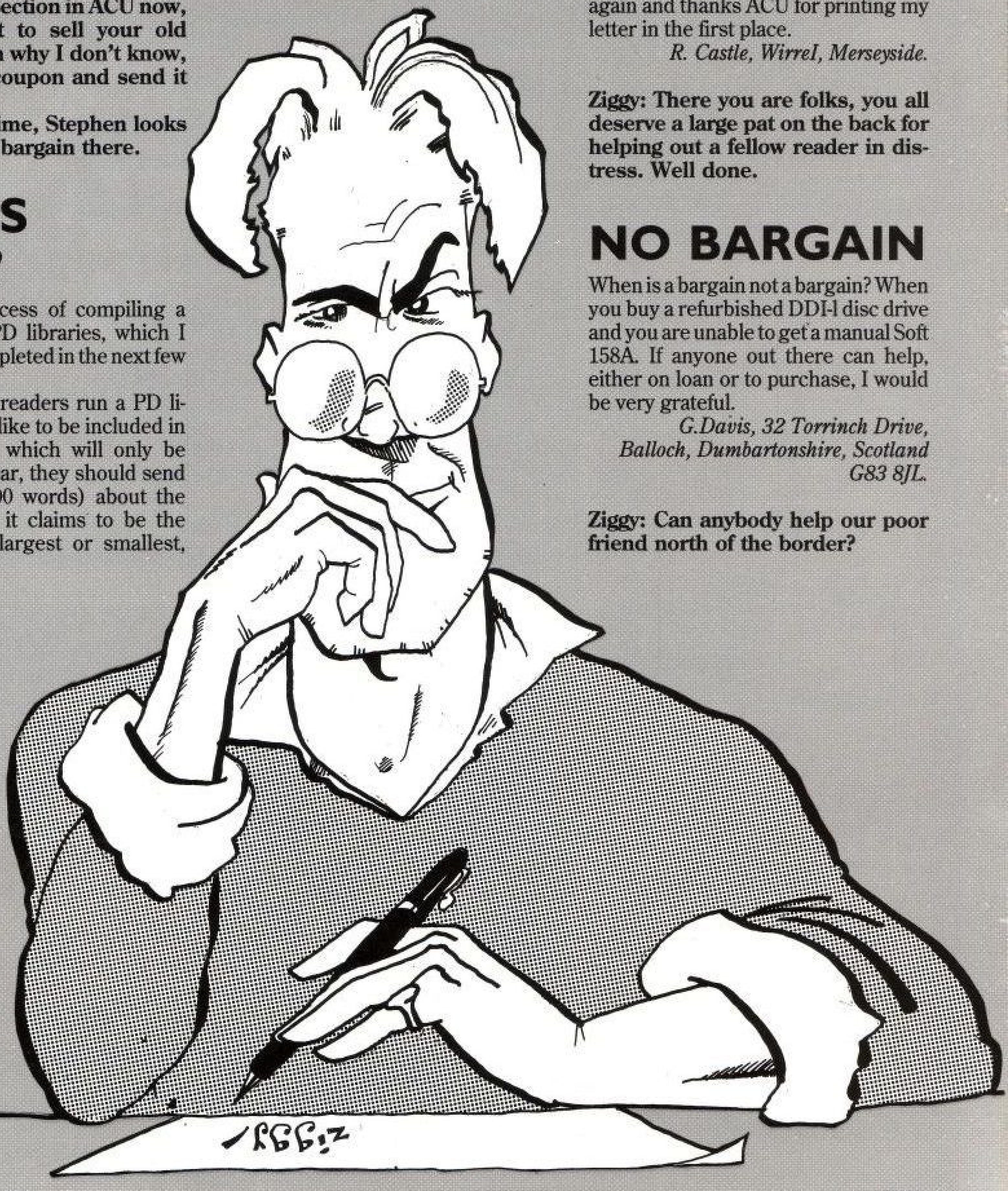
Ziggy: There you are folks, you all deserve a large pat on the back for helping out a fellow reader in distress. Well done.

NO BARGAIN

When is a bargain not a bargain? When you buy a refurbished DDI-l disc drive and you are unable to get a manual Soft 158A. If anyone out there can help, either on loan or to purchase, I would be very grateful.

G.Davis, 32 Torrinch Drive, Balloch, Dumbartonshire, Scotland G83 8JL.

Ziggy: Can anybody help our poor friend north of the border?



COMPETITION



Roll up all you Turrican freaks! Here's your chance to have your very own robot friend. A fantastic Tomy Omni Junior robot, to be exact, courtesy of those generous people at Rainbow Arts.

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So, get drawing, and don't forget to state your preferred format on your entry.

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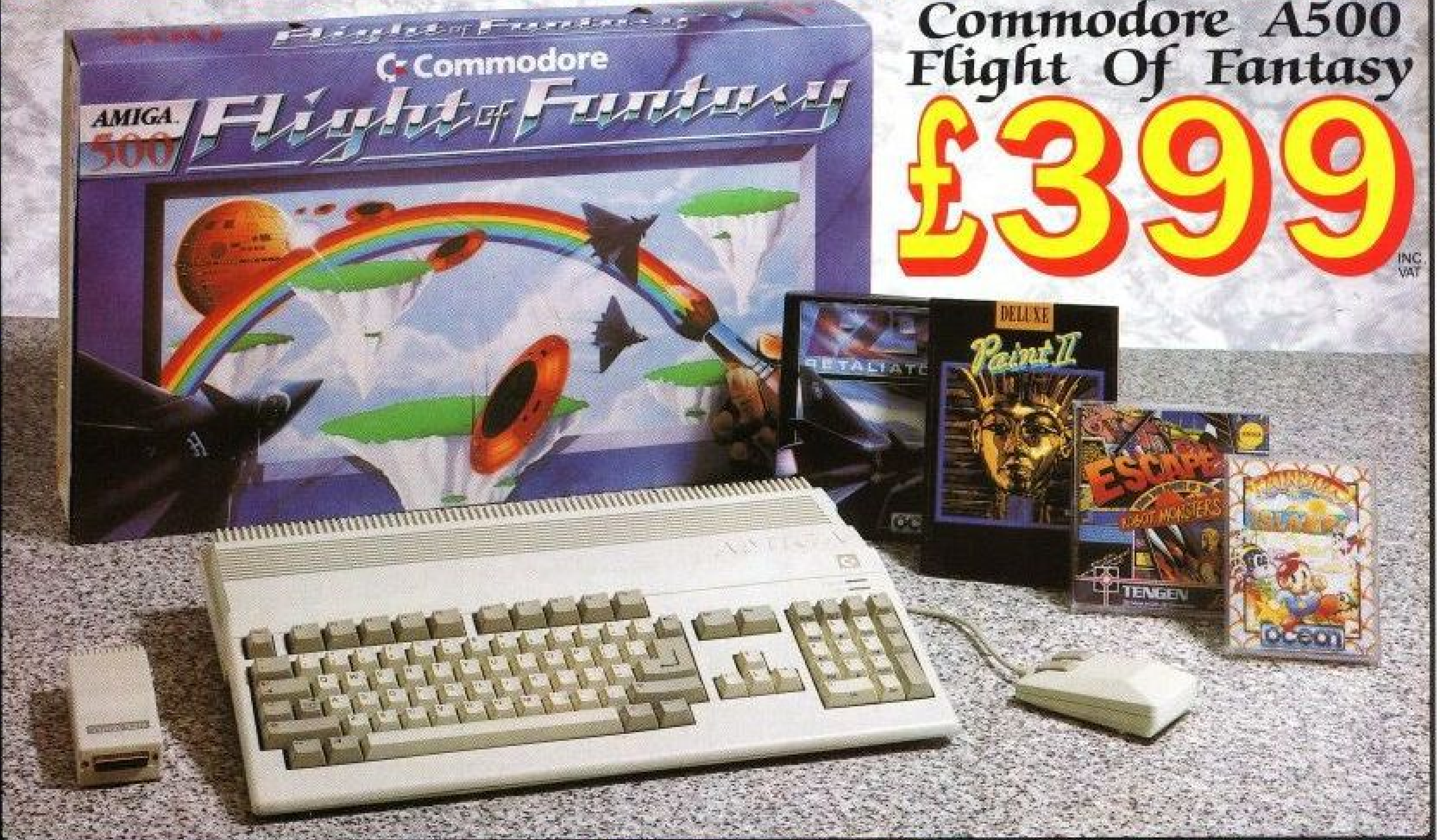
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£399 INC VAT

AMIGA 2000



For the more serious or professional applications user, Commodore have a selection of systems based around the expandable Amiga 2000, at prices from £1295+VAT. The A2000 features a full 1Mb RAM (expandable to 9Mb), 9 system expansion slots, plus IBM compatibility with the use of PC-XT or PC-AT bridgeboards. Complete and return the coupon, putting a tick in the A2000 box, for details of A2000 computer systems.

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The ultimate in flight simulation with a choice of two aircraft and four battle environments with dozens of different tactical missions. Aerial combat, strategic bombings, interactive ground based battles, seagoing carriers ... the list of features is endless. Real time cockpit displays, including 'true radar' enhance the realistic feel of this stunning simulation.

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OMEGA SCROLL

By David Hall

Here's another beauty from the Hall catalogue. Run it, follow the on-screen prompts and you can create your own message of up to 29,000 characters to the screen. David's created his own demo which is pretty mega, so read through it, then try your own. It looks a treat.




```
10 IF PEEK(40100)<>129 THEN SYMBOL AFTER 31:MEMORY 9999:INK
0,0:INK 1,16:INK 5,3:BORDER 0:POKE 40100,129:l=10000:FOR m=1
 TO 2:READ a$:FOR t=1 TO LEN(a$) STEP 2:POKE l,VAL("&"+MID$(
a$,t,2)):l=l+1:NEXT:NEXT [80]
20 MODE 1:PEN 3:PRINT "O M E G A   S C R O L L":PRINT:PEN 2:
PRINT "1)Load a message":PRINT "2)Create a message":PEN 1:PR
INT:PRINT "SELECT 1 or 2":INPUT a$:IF a$="1" THEN PRINT:LINE
 INPUT "Filename :",f$:LOAD f$,10299:st=40000:FOR t=1 TO 260
0:NEXT:GOTO 100 [D8]
30 x=1:y=1:st=10300:MODE 2:PEN 1:PRINT " OMEGA SCROLL by Dav
id Hall - Please type your message  ( SPACE LEFT = 29700 )":
PRINT " ===== ======  (c) Dec 1990":PRINT STRING$(80,"*"):LO
CATE 1,25:PRINT STRING$(80,"*");:WINDOW #1,1,80,4,24 [CD]
40 LOCATE #1,x,y:PRINT #1,CHR$(143):i$=INKEY$:IF i$="" THEN
40 ELSE IF i$=CHR$(127) THEN LOCATE #1,x,y:PRINT #1," ":SOUN
D 4,1000,2:GOTO 80 [38]
50 IF i$=CHR$(16) THEN 40 ELSE IF i$=CHR$(13) OR st=40000 TH
EN CLS:PRINT "SAVE THE MESSAGE (Y/N) ?":WHILE LOWER$(i$)<>"y
" AND LOWER$(i$)<>"n":INPUT i$:WEND:GOTO 100 [1D]
60 IF ASC(i$)<128 THEN SOUND 4,100,2:POKE st,ASC(i$)-31:st=s
t+1:LOCATE #1,x,y:PRINT #1,i$:x=x+1:IF x=81 THEN x=1:y=y+1:I
F y=21 THEN PRINT #1:y=y-1 [6A]
70 LOCATE 71,1:PRINT 40000-st:GOTO 40 [85]
80 IF x=1 AND y=1 THEN 40 ELSE x=x-1:IF x=0 THEN x=80:y=y-1:
IF y=0 THEN y=1:x=1:DATA AF32A59C213B2822A89C21F1C53E02545D1
D06010E3FEDB016061EC1193D20EF3E06CD19BD545D1D06010E3FEDB0160
61EC1193D20EF3AA59CFE0020223E8032A59C2AA89C237EFEFF2004213C2
87E22A89C21 [5E]
90 POKE st,1:st=st-1:GOTO 40:DATA F49F110800471910FD22A69C21
3FC6ED5BA69C0600DD21AD270E08EB3AA59CA6280779328B27DD7E003294
27EBD5060436007CC6086730041150C01910F2D1130D20D83AA59C1F32A5
9CC9F0F0CCCF300C0F3C [6E]
100 MODE 0:FOR t=st TO st+39:POKE t,1:NEXT:POKE st+40,255:IF
 LOWER$(i$)="y" THEN INPUT "Filename ";f$:SAVE f$,b,10299,(s
t+42)-10299:CLS:FOR t=1 TO 7000:NEXT:CALL 10000:WHILE st:CAL
L 10010:WEND ELSE CALL 10000:WHILE st:CALL 10010:WEND [45]
```

INTELLIGENCE

By Laurence Rapaccioli

Here's a little something to test your grey cells. Pick a difficulty level and try working out the next numbers in a series of sequences. On level one, it's easy-peasy, but just you try the high levels.



```
10 MODE 1:INK 0,0:BORDER 0:INK 1,18:INK 2,20:INK 3,6:PEN 1:L
OCATE 10,2:PRINT"I N T E L L I G E N C E":PEN 2:LOCATE 19,3:
PRINT"Test.":PEN 3:LOCATE 10,4:PRINT"By Laurence Rapaccioli" [2D]
20 PRINT:PRINT"In this Intelligence Test the computer  will
produce a sequence of numbers or   letters.You will have two
 attempts to   work out what's next in the sequence." [2C]
30 PEN 2:PRINT"Enter Difficulty Level Easy>(1-5)<Hard":INPUT
 O:IF O<1 OR O>5 THEN 30 ELSE Z=30*O:PEN 1:PRINT"You must no
w enter how many sequences   you want the computer to test y
ou on." [E4]
40 INPUT A:DEF FNA=INT(RND*Q)+1:FOR N=1 TO A:PEN 2:Q=1000:B=
FNA:G=FNA:Q=Z:C=(FNA+Z-30)*(1+2*(RND(1)<0.5)):H=(FNA+Z-30)*(
1+2*(RND(1)<0.5)):Q=40:J=FNA+Z:Q=O:ON FNA GOSUB 70,80,90,90,
90 [53]
50 FOR T=1 TO 1500:NEXT T:NEXT N:CLS:PEN 2:PRINT"You scored
";E;" out of ";A:PRINT:PRINT"PRESS SPACE FOR ANOTHER GO OR A
NY OTHER KEY TO FINISH":WHILE I$="":I$=INKEY$:WEND [AA]
60 IF I$=" " THEN RUN ELSE PEN 3:PRINT"GoodBye!":END [3C]
70 FOR M=1 TO 5:PRINT B;",";:B=B+C:NEXT:PRINT:PEN 3:INPUT "W
hat's next";F:IF F=B THEN PRINT"CORRECT":E=E+1:SOUND 1,100:R
ETURN ELSE PRINT"WRONG":SOUND 1,500,100:PRINT"It was ";B:RET
URN [D4]
80 FOR M=1 TO 5:PRINT B;",";G;",";:B=B+C:G=G+H:H=H+J:NEXT:PR
INT:PEN 3:INPUT "What's next";F:IF F=B THEN PRINT"CORRECT":E
=E+1:SOUND 1,100:RETURN ELSE PRINT"WRONG":SOUND 1,500,100:PR
INT"It was ";B:RETURN [F4]
90 FOR M=1 TO 5:PRINT B;",";:B=B+C:PRINT B;",";:B=B-H:H=H-J:
C=C+J:NEXT:PRINT:PEN 3:INPUT "What's next";F:IF F=B THEN PRI
NT"CORRECT":E=E+1:SOUND 1,100:RETURN ELSE PRINT"WRONG":SOUND
 1,500,100:PRINT"It was ";B:RETURN [D6]
```

MISSION CLEAN-UP

By Laurence Rapaccioli

Guide your Zargon spacecraft through the outer reaches of the galaxy in search of fuel. Use the cursor keys to pick up the green stuff, but avoid the red fuel- it's deadly stuff. Die, and you'll be presented with your score and a chance to have another go.

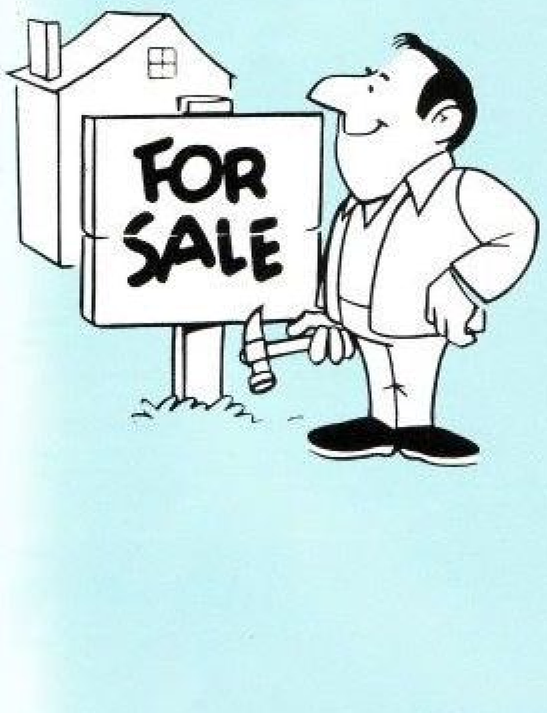


```
10 MODE 1:INK 0,0:BORDER 0:INK 1,26:INK 2,18:INK 3,6:SYMBOL
AFTER 256:SYMBOL AFTER 240:PEN 1:PRINT"S P A C E  M I S S I
O N  C L E A N U P":PEN 2:PRINT:PRINT"By Laurence Rapaccioli
" [AF]
20 PRINT:PRINT:PEN 3:PRINT"You are in control of Zargon spac
ecraft.YOUR MISSION. A cargo ship has self     destructed in
 the Qulax sector.On board were fuel supplies which have lea
ked" [97]
30 PRINT"into space.YOU have to collect the GREEN fuel by mo
ving your ship(via left/rightcursor keys)into the fuel.DO NO
T COLLECTRED FUEL, RED FUEL IS HIGHLY VOLITILE" [A8]
40 PRINT"AND EXPLOSIVE!.Points are awarded for   fuel collec
tion.GOOD LUCK!":PRINT:PEN 1:PRINT"PRESS ENTER TO START":INP
UT A$:MODE 0 [D3]
50 SYMBOL 240,1,1,3,131,198,205,251,127:SYMBOL 241,128,128,1
92,193,99,179,223,254:ENV 1,3,5,4::PEN 2:X=320:A=RND*639:B=3
99:E=B:C=20:D=3:TAG [51]
60 WHILE NOT (A>X AND A<X+64 AND D=3 AND E<20):B=B-C:E=E-C-A
BS(C-32):PLOT RND*639,399,1:PLOT A,B,D:DRAWR 7,0 [95]
70 TAGOFF:LOCATE 1,1:PRINT CHR$(11)CHR$(11):IF B<0 THEN B=RN
D*100+300:E=B:A=RND*639:C=RND*35+5:D=INT(RND*2)+2 [29]
80 SCORE=SCORE-2*(A>X AND A<(X+64) AND D=2):TAG:MOVE X,16,2:
PRINT CHR$(240)CHR$(241);:IF INKEY(8)=0 AND X>12 THEN X=X-12
 ELSE IF INKEY(1)=0 AND X<570 THEN X=X+12 [84]
90 SOUND 1,500,12,0,1:SOUND 2,505,12,0,1,,B/13:WEND:SOUND 5,
0,300,13,,,31:FOR N=1 TO 100:PLOT X+RND*64,RND*16,RND*14+1:I
NK 0,RND*26:NEXT N:INK 0,0:FOR N=1 TO 200:PLOT X+RND*64,RND*
16,0:NEXT [20]
100 MODE 1:PEN 1:PRINT"Your Score is ";SCORE:PRINT:PRINT"PRE
SS ENTER TO PLAY AGAIN":INPUT A$:RUN [39]
```

HOUSE

This one is just what it says it is. Run it and this neat little graphics set-up will present you with a cosy looking detached property which, by adding to it yourself, you can use with anything you like.

By Simon Baker and Kevin Parker




```
10 MODE 0:CLS:INK 1,0:INK 2,10:INK 3,3:MOVE 50,50:DRAW 50,30
0:DRAW 400,300:DRAW 400,50:DRAW 50,50:MOVE 100,100:FILL 3:MO
VE 50,300:DRAW 30,300:DRAW 80,350:MOVE 400,300:DRAW 420,300:
DRAW 370,350:DRAW 80,350:MOVE 100,320:FILL 2:MOVE 100,350:DR
AW 100,390 [98]
20 INK 0,20:INK 4,9:MOVE 0,50:DRAW 640,50:MOVE 40,40:FILL 4:
BORDER 20:MOVE 100,390:DRAW 120,390:DRAW 120,350:MOVE 110,36
0:FILL 3:MOVE 380,50:DRAW 380,180:DRAW 300,180:DRAW 300,50:I
NK 5,25:MOVE 310,60:FILL 5:MOVE 80,80:DRAW 80,170:DRAW 170,1
70:DRAW 170,80 [94]
30 DRAW 80,80:MOVE 100,150:INK 6,26:FILL 6:MOVE 125,80:DRAW
125,170:MOVE 80,125:DRAW 170,125:MOVE 370,200:DRAW 370,290:D
RAW 280,290:DRAW 280,200:DRAW 370,200:MOVE 360,210:FILL 6:MO
VE 325,200:DRAW 325,290:MOVE 370,245:DRAW 280,245:MOVE 80,20
0:DRAW 80,290 [1C]
40 DRAW 170,290:DRAW 170,200:DRAW 80,200:MOVE 90,220:FILL 6:
MOVE 80,245:DRAW 170,245:MOVE 125,200:DRAW 125,290:DEG:FOR a
=1 TO 360 STEP 15:MOVE 360,115:PLOT 360+7*COS(a),115+7*SIN(a
):NEXT:MOVE 361,116:FILL 1:MOVE 400,225:DRAW 620,225:DRAW 62
0,50  [99]
50 MOVE 620,225:DRAW 640,225:DRAW 590,275:DRAW 400,275:MOVE
600,80:FILL 3:MOVE 410,250:FILL 2:MOVE 415,50:DRAW 415,210:D
RAW 605,210:DRAW 605,50:MOVE 420,100:FILL 5:FOR a=50 TO 210
STEP 20:MOVE 415,a:DRAW 605,a:NEXT:DEG:FOR a=1 TO 360 STEP 1
5:MOVE 510,120 [9F]
60 PLOT 510+7*COS(a),120+7*SIN(a):NEXT:MOVE 511,121:FILL 1 [80]
70 FOR a=1 TO 26:READ note,dur:SOUND 1,note,dur-5,15 [29]
80 DATA 239,50,213,50,190,75,179,75,142,50,159,75,190,50,159
,50,179,50,190,50,179,50,213,50,190,100,239,50,213,50,190,75
,179,75,142,50,159,75,190,50,159,50,179,50,190,50,179,50,213
,50,239,100:NEXT [2C]
90 CALL &BB18:MODE 2 [8F]
```

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ACU4

Strings and loops

Programming maestroGlynne Davies leads on in the quest to take the aches and pains out of BASIC.

Last month I introduced you to the world of Basic, covering some general key words and numeric variables, this month we will concentrate on String variables and Loops.

String Variables

A string variable is a single or a series of characters, inverted commas are used to state the beginning and end of a String. Letters or numbers can be placed within a string, if a number is placed into a string no maths can be carried out on that number directly. A string variable name has a dollar ($) sign at the end of the name.

Typical String Names

firstname$ word$ address$ a$ d1$ cursor$ title$

Pronounce the dollar sign as string.

New key words

TAB(n) A TAB after a PRINT statement is replaced on screen by a number of spaces moving the print position, then n in brackets can be any number up to 255 and states how many spaces.

SPC(n) SPC means SPaCe and works the same as TAB

LEN(n$) The LEN key word gives the LENgth of the string within the brackets, the length of n$ in this case.

+ A plus sign (+) is used to add one string to the end of another. i.e. "String"+"Variables"= "String Variables"

MODE 1 The key word MODE changes the screen display.MODE 0 = 20 columns, MODE 1 = 40 Columns and MODE 2 = 80 Columns across the screen all with 25 lines down. MODE will Clear the Screen.

A Note about REMs. As I will be using the REM statement to describe lines within the program, the program listing may seem a little daunting, however it is not necessary to type in the REMs or the descriptions, as you have a copy. You should use plenty of REMs in your own program. You can miss out the REM statements as the example below.

Line with REM

10 MODE 1:REM Set screen to 40 by 25 down

Same line without REM

20 MODE 1

Example SV1

```
10 REM String Variables and printing in the centre.
20 MODE 2:REM Set to 80 x 25
30 name$="*AMSTRAD **BASIC*":REM Set up a string variable called name string to equal AMSTRAD BASIC
40 onechar$="*":REM Set up a string with one character in it
50 spaceonechar$=" "+onechar$:REM Set up spaceonechar$ to two characters a space and a *. Note no spaces are allowed in the name.
60 word1$="AMSTRAD":word 2$="COMPUTER":word3$="USER"
70 threeword$=word1$+" "+word2$+" "+word3$:REM Adding strings to the end of others. Note the quotes contain a space.
80 PRINT TAB((80-14)/ 2);name$:REM Print name$ in the middle. Note the Maths. 80=length of screen 14= length of name$. 80-14=66/2=33
90 REM The computer will Calculate in this order, brackets, *, /, +, –. If in doubt of the maths use brackets.
100 PRINT:PRINT:PRINT SPC((80-LEN(threeword$))/ 2);threeword$:REM Place threeword$ in the centre, without knowing the length of threeword$
110 REM Build a triangle
120 PRINT TAB(40);onechar$:REM Start in the middle of the screen
130 PRINT TAB(39);onechar$+spaceonechar$:REM Print 3 characters
140 PRINT TAB(38);onechar$+spaceonechar$+ spaceonechar$:REM Print 5 Characters
150 END
```

When you have typed in this listing and successfully "run" it try adding another line to the triangle, use line 145. Also change line 20 to MODE 1. When the screen is in MODE 1 you have only 40 Characters across the screen and you will need to change lines 80, 100, 120, 130, 140 and 145 for the correct TABs or SPCs.

Loops

Most activities carried out by a computer can be broken down to a simple task which is repeated, this is a loop. When you ask the computer to PRINT 5*6 it will add 5 to a total 6 times, a loop is set up to repeat 6 times adding 5 to a total each time, ending with a total of 30.

New key words
FOR/NEXT LOOP

FOR The start of a FOR/NEXT loop, giving the condition of the loop. i.e. FOR loop=1 TO 100:REM start at 1 and count to 100, repeating the section beneath up to the NEXT loop statement.

NEXT The End of a FOR/NEXT loop, Sends the program flow back to the FOR.

STEP The amount to add or subtract at each time. i.e. FOR count=1 TO 50 STEP 3:REM add 3 to count each time.

WHILE/WEND LOOP

WHILE The start of a WHILE/WEND loop, the WHILE has a condition of entry or exit. i.e. WHILE score=50. The loop will be used only if score=50

WEND The End of a WHILE/WEND loop, sends the program flow back to the WHILE

INPUT Allow information to be typed into the program i.e. INPUT name$ will stop the program and wait until you type in a word and press return, placing that word into the variable name$. The Input can be string or numeric.

**INKEY$** Scans the keyboard to see if a key is pressed, does not stop. i.e. k$=INKEY$ if a key is pressed k$ will equal that key, must be within a loop of work.

CALL Run a Machine Code program, you can use a function available in the system. i.e. CALL &BB18 uses an operating system routine which waits for a key press.

RND(1) Choose a RaNDom number i.e. RND(1) produces 0.36

INT(num) Make a whole number (INTeger) of num i.e. num=12.4 INT(num)=12

Program 1 (loop1)

```
10 REM Loops, Repeating the same
part of the program
20 CLS
30 INPUT "Enter your name
";title$:REM The computers waits for
you to Enter (Input) a string. which is
placed in title$
40 INPUT "Enter how many times
";times:REM Input a number
45 REM Start of a FOR/NEXT loop.
The variable n is set to 1 for the first
time through the loop. When the
program flow reaches line 70 (NEXT
n) the flow is sent back to 50, The
step size is added to n until n is
greater than the variable ( times ).
50 FOR n=1 TO times STEP 1
60 PRINT n;" ";title$;" ";
70 NEXT n:REM Go back to the FOR
statement.
80 END
```

Program 2 (loop2)

```
10REM The minus to plus loop
20 CLS
30 INPUT "Enter a large number
";bignum:REM Numeric variable
input
40 INPUT "Enter the step up size
";up
50 FOR n=-bignum TO bignum STEP
up:REM minus numbers can be dealt
with
60 PRINT n,:REM The , places a
certain amount of spaces after the
number n
70 NEXT n
80 END
```

Program 3 (loop3)

```
10 REM The countdown loop,
producing a triangle
20 MODE 1:star$="*"
30 FOR n=20 TO 1 STEP -1:REM The
variable n can be any name. When
setting up loops it is best to keep with
one variable unless that variable is
needed within the program.
40 PRINT TAB(n);star$
50 star$=star$=" *":REM add a space
and * to star$
60 CALL &BB18:REM A machine
code call, makes the program stop
until a key is pressed
70 NEXT n
80 END
```

Program 4 (loop4)

```
10 REM The WHILE/WEND loop
20 CLS
30 WHILE k$<>" ":REM This loop
has a condition k$<>" " which means
that the loop will continue until the
spacebar is pressed (condition :-The
loop continues while k$ will equal
that key
50 PRINT SPC(10);k$
60 WEND:REM End of the WHILE
loop (While END), sends the flow
back to the WHILE
70 END
```

Program 5 (loop5)

```
10 REM A WHILE/WEND loop
using a random number
20 CLS
30 WHILE num<>45:REM The loop
will continue until Num=45
40 num=INT(RND(1)*200):REM
RND(1) chooses a random ? number
between 0 and 1 the random number
is then times by 200, it is then made
an INTeger (Whole Number)
50 PRINT "The random number
is";num
60 WEND
70 END
```

Program 6 (loop6)

```
10 REM Nested loops, one or more
loops within another loop
20 REM Times Tables. Note the
FOR/NEXT loops have no STEP
size. If this is left off the STEP size of
1 is automatically chosen. 30 FOR
table-1 TO 12:REM for 1 to 12 times
table *** LOOP 1
40 CLS:PRINT "Times Table
for";table:PRINT
50 FOR multiply=1 TO 12:REM ***
LOOP2
60 PRINT table;" x";multiply;"
=";table*multiply
70 NEXT multiply:REM End of
LOOP2
80 PRINT:PRINT "Press any key for
the next table":CALL &BB18:REM
CALL &BB18 wait for a keypress
before continuing
90 NEXT table:REM End of LOOP1
100 PRINT:PRINT "That was the last
table":PRINT CHR$(7):REM
CHR$(7) = a Beep
110 END
```

Next month I will be looking at how to store information within the listing and how to make decisions. Program 7 is a graphics program, you should be able to understand some of the lines, it is included here to show you the variation which can be achieved using loops.

Program 7 (Spiral, a graphic demonstration of loops)

```
10 REM Multi-shape spiral
20 MODE 1:REM Set screen 40 x 25
30 BORDER 4:INK 0,0:INK 1,2:INK
2,23:INK 3,17:REM Change the
colours of the 4 pens available
40 arc=1:colour=1
50 WHILE 1:REM An endless loop,
Press ESC to ESCape from the
program
52 side=0:angle=0
55 WHILE side<0.1 OR side>15:REM
Set up a loop to restrict Input
56 LOCATE 20,1:PRINT SPC(5)
60 LOCATE 4,1:INPUT "How many
sides ";side
70 WEND:REM side must be from .1
to 15
80 WHILE angle<0.1 OR angle>9
85 LOCATE 33,1:PRINT SPC(5)
90 LOCATE 4,1:INPUT "What angle
of spiral .1 to 9";angle
100 WEND:REM angle must be from
.1 to 9
110 angle=angle*40:REM Change
Angle to degrees i.e 9 x 40 = 360
120 CLS:MOVE 320,200:REM Move
to the middle of the screen
130 FOR loop%=1 TO 65:REM loop%
is a Integer, the computer will work
```

faster using Integers (Whole Numbers)
140 FOR circle+-PI+add TO PI=add STEP (2*PI)/side:REM PI =3.1416
150 DRAW 320+(arc*SIN(circle)),200+(arc*COS(circle)), colour:REM Draw a line
160 NEXT circle
165 colour+(colour+1) MOD 3:colour=colour+1:REM colour +1 then 2 then 3 then 1 etc
170 DRAW 320+(arc*SIN (PI+add)),200+(arc&COS(PI+add)), colour:REM Draw a line
180 add=add+(2*PI)/angle
190 arc=arc+6
200 MOVE 320+(arc*SIN(-PI+add)),200+(arc*COS(-PI+add))
210 NEXT loop%
230 arc=1:add=0:REM Reset variables
240 WEND:REM Return to the WEND

Data

Fixed information needed by a program can be held in a list within the listing. The list is called a DATA list and information is obtained from the list using the key word READ.

New key words
READ/DATA

READ Take the next piece of Data from the Data list.
DATA A key word to precede the list of information.
RESTORE Reset the data pointer to the start of the Data. This key word can also reset to a certain line number i.e. RESTORE 1000.

General key words

LOCATE x,y Position the cursor at x horizontal and y vertical so that Information can be Printed at that position.
sum MOD n The MOD key word is a form of divide, n is divided into sum, the answer however is what remains. i.e. 20 MOD 3 = 2
GOSUB n Send the program flow to a line number n (GOSUB 1000), use the routine at n (1000) and then Return back to the next key word after the GOSUB. (GO SUB-routine)
RETURN Used at the end of a SUB-routine, sends the program flow back.

Program 1 (Data1)

10 REM READ / DATA Numeric Data
20 CLS:FOR amount=1 TO 10
30 READ number:REM Look for the next piece of Data, make number equal to that data.
40 PRINT "Data item number ";amount;" = ";number
50 NEXT amount:END
990 REM Each piece of Data is separated using a comma. Note if you try to Read more Data than is available the error message will refer to line 30 not the data lines.
1000 DATA 40,78,1,23,567,10001,10.78,99,.99,111,234

Program 2 (Data2)

10 REM READ / DATA Strings and Numerics
20 MODE 0:REM 20 x 25, 16 Colours
30 READ quantity:REM Find out how much data from the first piece of Data
40 FOR loop=1 TO quantity:REM Loop to read in all the string data
50 READ flag$:REM read each line of the flag design
60 PEN loop:REM Set the colour of the line. PEN can be from 0 to 15, PEN 0 is the background colour.
70 LOCATE 5,loop+4:PRINT flag$:REM Print the string at 5 in from the left, loop+4 down from the top
80 NEXT loop:END
2000 DATA 5:REM The amount of Data below
2010 DATA "+++++——":REM A string 10 characters long
2020 DATA "——+++++":REM the second line of the design
2030 DATA "**********"
2040 DATA "——+++++"
2050 DATA "+++++=====":REM All this information could be held on one line, each piece separated with a comma
2500 REM By using a new line you can see the design.
2510 REM After you have "Run" this program add some more data lines to produce a bigger flag
2520 REM Count the amount of lines from line 2010 and change the data number on line 2000 to the new amount, keep below 15

10 REM RESTORE, rest the data back to the start
20 MODE 1:PRINT "Do Not press the Spacebar":REM A challenge !, press the spacebar for comments any other key to stop the program.
30 k$="":WHILE k$="":k$=INKEY$:REM Set up a loop and scan the keyboard
40 loopcount=loopcount+1:REM Set up a counter
50 IF k$=" " THEN GOSUB 1000:REM IF you press the Spacebar " "GO SUB-routine at line 1000, when complete return back to here.
60 WEND:END
1000 Pick a statement from a Data list
1010 RESTORE:REM A pointer moves through the data list, RESTORE sets the pointer to the start.
1020 loopcount=loopcount MOD 5:REM Divide loopcount by 5 and set loopcount to equal the remainder i.e. 0 to 4
1030 FOR choice=1 TO loopcount+1
1040 READ answer$:NEXT choice:REM set answer$ to the piece of data (loopcount+1) from the start
1050 LOCATE 5,15:PRINT SPACE$(20):REM Erase the last statement
1060 LOCATE 5,15:PRINT answer$:REM Print at 5 across 15 down the answer
1070 k$="":REM Set k$ to equal nothing, if not the program will stop
1080 RETURN:REM Send the program flow back to the REM on line 50

4000 DATA "Who did that !","Leave that key alone","Give me a rest","How many times have I told you","Stop touching me there"

Decisions

It is often necessary in a program to compare a variable and depending on it's value carry out certain operations. A game may require that a new level is entered when a score reaches 100, these decisions can be carried out by the use of IF/THEN statements. In the last program IF the spacebar was pressed the sub-routine at 1000 was used. (see line 50) IF/THEN conditions.

New key words

IF The start of an IF/THEN statement. After the IF a condition is placed i.e. IF score=100
THEN THEN must follow the condition after an IF statement, what follows the key word THEN are the operations you wish to carry out if the condition is true. i.e. IF marks=100 THEN PRINT "100%"
ELSE The ELSE key word can be placed after a IF/THEN statement, conditions after the ELSE will be carried out when the IF condition is false i.e. IF marks-100 THEN PRINT "100%" ELSE PRINT "Not Perfect"

Program 1 (IFTHEN1)

```
10 REM Guess the Number
20 MODE 1
30 random=INT(RND(1)*1000):
REM choose a number up to 1000
40 FOR trys=1 TO 10:REM Give ten
attempts
50 PRINT "Please Enter your guess
number ";trys;":-";
60 INPUT checknumber:REM Enter
the guess
70 IF checknumber<random THEN
PRINT "Your guess was too low"
80 IF checknumber>random THEN
PRINT "Your guess was too high"
90 IF checknumber=random THEN
PRINT "Correct in ";trys;"
attempts":yes=1:trys=10:REM Note
on the correct answer leave the loop
by setting trys to 10
1000 NEXT trys
110 IF yes=0 THEN PRINT "The
answer was ";random;", Please try
again" ELSE PRINT "Top
Marks":REM Will print one of the
two print statements
120 END
```

Program 2 (IFTHEN2)

```
10 REM More than on condition
20 MODE 2:PRINT "To stop this loop
you must press A and B in any order
and then C"
30 WHILE trip=0:REM trip will equal
0 when first run
40 k$=INKEY$:REM Scan the
keyboard
50 IF k$="A" OR k$="a" THEN
first=1:REM Note if you ask for a key
it can be upper or lower case
60 IF k$="B" OR k$="b" THEN
second=1:REM Pressing B sets
second to 1
70 IF (k$="C" OR k$="c") AND
first=1 AND second=1 THEN
trip=1:REM If all the conditions are
correct then leave the loop, the loop
condition was loop=0
75 REM Note the brackets above,
treating the two conditions as one
where the AND is concerned.
80 WEND:PRINT "The loop is
finished":END
```

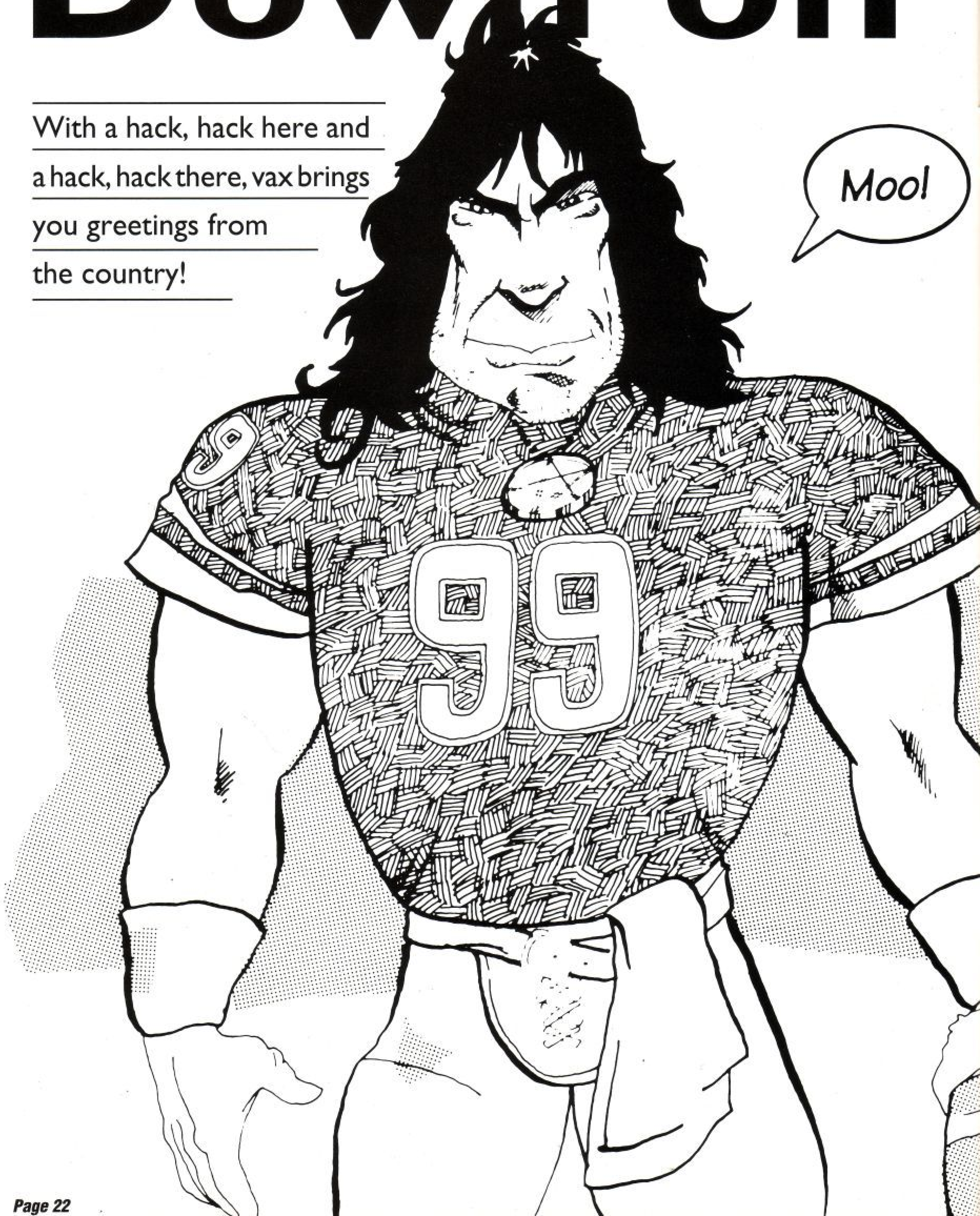
The next program is an example of using arrays, which is next months subject together with string handling, as always you should understand some of the lines while others will become clear within the coming months.

Program 3 (RNDBARCH A Random Bar Chart)

```
10 DEFINT a-z:REM define all
variables as integers (whole
numbers)
20 DIM y(12):REM reserve 13
variables y(0) (not used) y(1) y(2)
etc
30 BORDER 0:INK 0,0
40 MODE 1
50 WHILE k$=""
60 r=INT(RND(1)*12):REM Choose
a random number 1 to 12
70 c=r MOD 2:REM Take the
random ( r ) number divide it by 2
and set up variable c to the
remainder i.e. ( 0 or 1 )
80 MOVE r*50,y(r):REM Move the
graphics cursor to r times 50 at the
height of y(r)
90 DRAW r*50+40,y(r),c+2:REM
draw a line 40 long from the move
position
100 y(r)=y(r)+2:REM Add 2 to y(r)
increasing its height
110 IF y(r)>300 THEN k$="1":REM If
any of the y(r) variables reach over
300 then k$ is changed stopping the
loop
120 WEND
130 END
```

Down on

With a hack, hack here and a hack, hack there, vax brings you greetings from the country!



the Farm

Come right this way, folks, and have a guided tour of the Hack Farm. Be careful there mate, you might tread in some Amiga software. Yes, this is the very centre of the entire Hacker's Haunt, where tender young pokes are raised in the wild, with no unhealthy additives or copying routines, until they reach their peak of perfection. Then we bang 'em on the 'ead, and ship 'em out to you lot.

Our most prolific poke-breeder to date, vying hard with John "Hackman" Girvin, is one Graham Smith; a promising young hacker from Zummerzet. Obviously the Zider does him good, as he's sent in three tape pokes this month, and here comes the first one for Fantasy World Dizzy:

```
1 ' Fantasy World Dizzy
2 ' By Graham Smith
3 ' Infinite lives
4 '
10 DATA 2a,38,bd,22,20,be
20 DATA 21,37,bd,36,c3,23
30 DATA 36,1b,23,36,be,21
40 DATA 40,00,e3,11,00,bb
50 DATA c3,4a,3a,af,32,63
60 DATA a0,cf
70 FOR j=0 TO 31:READ a$
80 x=VAL("&"+a$):y=y+x
90 POKE j+48640,x:NEXT j
100 IF y<>3010 GOTO 130
110 MEMORY 14900:LOAD"
120 CALL 48640
130 PRINT"Wake up! Data error
```



By the way kiddies, don't drink too much of the Zider, as it isn't very good for little ones. Doesn't do a lot to improve big 'uns either, but that doesn't matter as we have Graham's second pokette of the month for Joe Blade 3 rising over the horizon:

```
1 ' Joe Blade 3
2 ' By Graham Smith
3 ' Infinite keys,ammo
4 ' discs & energy
5 '
10 DATA c4,14,ac,af,32,2a
20 DATA 1c,32,83,25,3e,c9
30 DATA 32,57,0f,c9,3e,8f
40 DATA 32,7f,41,3e,b3,32
50 DATA cc,41,21,62,46,36
60 DATA 92,2b,36,83,2b,36
70 DATA df,c3,05,40
80 FOR j=0 TO 39:READ a$
90 x=VAL("&"+a$):y=y+x
100 POKE j+48640,x:NEXT j
110 IF y<>3737 GOTO 140
120 MEMORY &3333:LOAD"
130 CALL 48656
140 PRINT"Data error, somewhere
```

That one gives you 2,000 times the recommended daily intake of keys, ammo, discs and energy. Keep taking the pills.

Can you smell something ? Ah yes, slightly-singed wholemeal organic pizza, straight from the wood-fired oven. Teenage Turtle flavour ; goes really well with the Zummerzet Zider. I'll eat this lot while you digest Graham's last pokeykins of the month for Blade Warrior (never heard of it Guv).Should give you a lorra, lorra lives and a lorra, lorra time:

```
1 ' Blade Warrior -tape-
2 ' By Graham Smith
3 ' Infinite lives & time
4 '
10 DATA 2a,38,bd,22,2a,be
20 DATA 21,37,bd,36,c3,23
30 DATA 36,1b,23,36,be,21
40 DATA 40,00,e3,11,00,bb
50 DATA c3,4a,3a,af,32,1b
60 DATA 03,3e,18,32,5c,62
70 DATA 3e,c9,32,a1,77,cf
80 FOR j=0 TO 41:READ a$
90 x=VAL("&"+a$):y=y+x
100 POKE j+48640,x:NEXT j
110 IF y<>3710 GOTO 140
120 MEMORY 14900:LOAD"
130 CALL 48640
140 PRINT"Data error. Don't worry, be happy.
```

Lots of blades flashing around here. Makes Bruno my Tomcat (and organic mousetrap) feel quite nervous, it does.

And what happened to my mailbag this month eh? Either it's on a diet or we've got a postal strike on 'cos it was only half an inch thick, and contained absolutely no bribes! Come on folks, support your local organic hackery, and send in your pokes to the address in the front of the mag. Fame and fortune (well, a few freebies at least) could be yours.

One that did make it as far as the mail bag came all the way from Oz. The sender is one Damon Schultz (took an effort to spell that right, did that) of Sellicks Beach. This is a hack so devious that you could hang a suit on it and get it to stand for Parliament. The victim is R-Type.

To achieve the ultimate in uncontrolled joy and happiness you - hang on, can't print that. OK, to achieve the penultimate in uncontrolled joy and happiness, you need to format yourself one side of a disk to Incredibly Boring Machine format, which you can do quite nicely with the "format i" command typed at a CP/M 2.2 prompt.

Right, one formatted disk. Load up the game and play level one (yeah well, sorry, but there it is). If you can't play level one, give up now and go play "Roland Organizes a Rave-up in a Brewery." When the game tries to load level two, pop in the formatted disk, preferably with the formatted side up. The computer, bless it's little silicon chips, thinks it has loaded level 2 but is still on level one.

How does this help ? Well, when it says "STANDBY FOR LEVEL x" (x being the level you want to play), pop in side two of the R-Type disk and the silicon idiot will load that level. Now you can skip levels that you don't want to play. Good on yer mate!

Well, that's it for this month folks. Must get back to the organical hack farming again, them pokes don't grow on trees you know. But while we're talking about Oz and trees, please help the great Australian forests - plant an acorn upside-down today!

Luv 'n' stuff,
Vax, Suz & the Brats

COMBAT ZONE



More blasts to look forward to from the land of the coin-op

There's a whole new revolution that's turning the coin-op world upside down literally! John Cook aka Sergent Amstrad, risks life, limb and losing his breakfast at Europe's biggest coin-op show.....

In the commercial cut and thrust of the Nineties, you have to be aware of every new business opportunity that presents itself. So people hang around traffic lights, cleaning car windows fast for cash. Use their mopeds to deliver pizza. But if you've got any spare moolah yourself, I'd suggest setting up chains of dry cleaners next door to coin-op arcades – because full motion simulators are arriving…and you'd better not have had a big breakfast before having a go on them.

At the latest coin-op trade show, the first full motion coin-op ever to reach these shores, called the R360 from those technical wizards at Sega of Japan, was proudly on display – although hopefully, you won't have to queue for 30 minutes to play it when it reaches your neck of the woods!

As soon as you climb into the futuristic looking globe, you know things are going to be different. First of all, once you're sitting comfortably, this u-shaped padded yoke comes over your head and swings down to sit against your chest. Next, two seat belts clip into this restrainer at waist level – left and right. Finally, you've got a hand-brake type of affair that, when you pull it, tightens the whole business up. Me, claustrophobic?

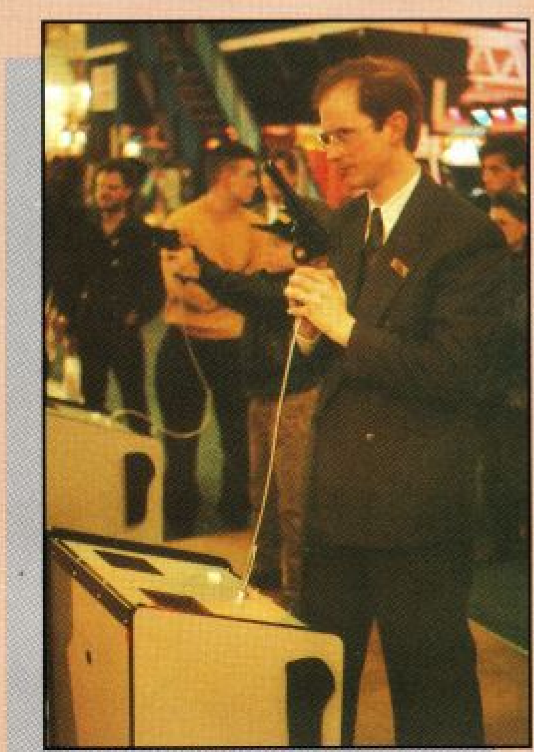
Once the action starts, however, one part of the your brain quietly thanks the Japanese engineers for taking so much care that you don't fall out of the R360. The other part is going spectacularly ga-ga – after all, the last time I felt like I was playing a video game upside down was after 12 pints of lager. This is for real.

At the moment, the only game installed in the R360 is an adapted version of G-Loc, but it's ideally suited to it.

G-Loc is a jet fighter game, remember, with some spectacular effects with your plane barrel rolling all over the shop and zooming through the skies. When you play it in the R360, it becomes a completely astonishing experience.

You take off - enemy fighters appear. You waggle the stick a little left and right and move slightly to get them into your sights. No big deal. One breaks off down and to the left, why not follow, eh? Waaaaaaa!!!!!

The unit immediately follows the movement of your joystick and the horizon – you are now flying on your



side. Another touch to the left – gulp! You're now flying upside down. I wish I hadn't eaten that burger!

Pull back on the stick – whoosh! A full loop – fantastic! You soon get used to the sensory overload and start playing the game again. Totally, totally awesome.

Completely excellent.

Cynics might say that the R360 is simply like playing games inside a tumble drier. But the fact is, not one person has come off the machine and not been convinced that this is the future of video games. It's pricey, but you owe it to yourself to play on this machine. It'll be in selected arcades from Easter. Just do it, man!

Sega had a large presence at the show – and what a bunch of guys. If you want sprites – these boys can give you sprites. Big, fast, rotated, expanded, reduced – the works. Just take a look at games like Line of Fire and Last Survivor for examples of that. But maybe it's in the field of driving games that they've found their greatest success – who can forget Outrun, Power Drift and Super Monaco Grand Prix?

Now Sega are trying to tempt the games players of the world with another epic, this time called Rad Mobile. Trouble is, this time they've concentrated on the technology and forgot about the gameplay.

The scenario has you driving your Radical Automobile in an illegal race across the continental United States of America, in vast numbers of stages – and there are, of course, some very neat touches.

Some stages are at night – so you have to turn your lights on in order to see properly. Cute and pretty nifty pallette manipulation. Others are in the rain – so you have to turn on your windsceeen wipers – lovely effect boys.

But despite this attention to detail (well, in fact they're just showing off some new routines inside the box) the gameplay itself is extraordinarily dull. Controls are straightforward gas pedal, hi/low gears and, natch, steering wheel. Opposition cars are about, with some of them marked specifically as Rivals – which try and make it difficult for you to pass them.

But – other than following the track and admiring the view, there's not much else to do.Trying to ram the enemy cars off the road just loses you valuable time. The screen effects, although very atttractive and pleasing to the eye, are in no way as dramatic as, say, the highly acclaimed Cisco Heat.

Worth playing the once, just to see









what state-of-the-art technology can do, Rad Mobile isn't going to set you alight – but points to the fact that Sega has the ability to do wonderful things on the screen. Now let's have a great game, eh?

Now, Laser Disc games like Dragon's Lair and Astron Belt have always been popular with the punters, because they're interesting, but not with the trade, because they're expensive and go wrong a lot. That explains why we haven't seen any for quite some time. But in the effort to keep one step ahead of the home systems, here comes another one – and it's jolly good.

It's a stand-up unit based in the Wild West. And instead of a joysrick, you have a traditional six shooter and must slug it out with live footage opponents that have the singleminded aim to get you into Boot Hill.

Based on a series of static screens, in which you must zap baddies as they stick their heads above cover to take a pot shot at you, there's also a basic adventure structure to the thing and a fun storyline holding the game together.

It's great – but even more entertaining than playing the game itself, is watching mild mannered individuals turn, as if by magic, into passable imitations of Clint Eastwood. Proving very popular on test, it's well worth giving this one a try, pard!

Feeling frustrated? Does going down the arcade and joystick waggling no longer bring the cathartic satisfaction it used to? How about going down the arcade and smashing the hell out of a video game – and still not getting arrested? Sonic Blast Man is for you, guy!

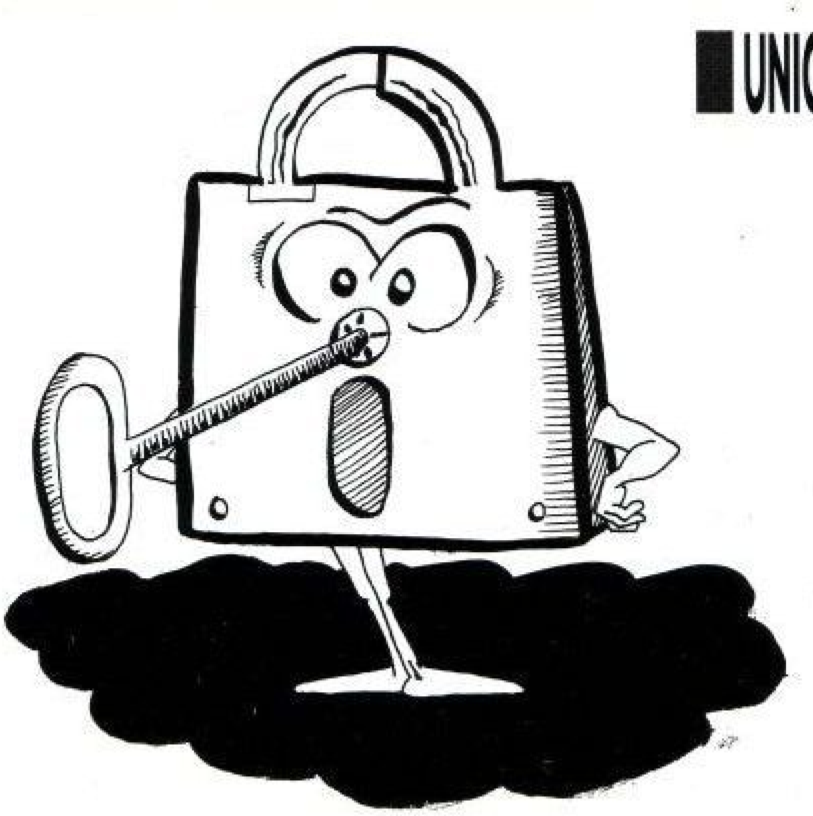
It's a game with a single control – a hinged pad below a video display. Put the attached boxing gloves on - and see some punk steal your girlie! Now give him your best shot! Ouch! That hurt my hand! And yet it hardly scratched the punk. Again! Wimper! One more time – Kapow!!!!! I may have fractured a few fingers, but at least the punk now looks a bit worse for wear.

You have three goes to bash the pad, which all add together to a butch value. If it's good enough, you go onto the next round, otherwise – game over. A bit of a laugh - if you can stand the pain!

Finally, Williams – the most consistent pinball manufacturers in the world – has just come up with its best game for ages, called Funhouse. Like Comet – an old pinball classic – it's based around the theme of a fairground, with the playfield dominated by a spooky ventriloquist's dummy caled Rudi, who keeps up a running commentary on your play.

A skillful table with some very special effects, if you're into pinball, you must have a go on Funhouse. Better still, buy one and keep it in the living room - to you, almost two grand, John!

That's it for this month – more arcade revelations next month – assuming the aliens don't get me first!



Protection Rackets

Andrew Banner hasn't got a Kray at home but is still running a nice little earner.

Nearly any piece of commercial software that you buy now will have some kind of copy prevention system on it to protect the software company's rights on the copyright of the material. Copy protection can be compared to having an alarm fitted to y our car with a flashing "armed" light – it's a deterrent, it makes it difficult for anyone to break the law.

So having copy protection, like having a car alarm, is a deterrent. In fact it stops amateurs from doing those things that they shouldn't. But having a car alarm didn't stop them when they wanted my speakers, sure the alarm went off and after the window had been broken and they ran – amateurs. In a similar way, if the going gets tough whilst some punk is trying to copy the latest blockbuster then, chances are he will give up because it's too awkward.

By the same token though, the old proverb "If at first you don't succeed…" does apply. It becomes a challenge, and if that's one thing that the human race is susceptible to, it's a challenge. So all of a sudden you've entered a no win situation, either you protect your software against theft or you don't and watch someone do it anyway? Here another proverb applies; "Better safe than sorry."

Wiring in a car alarm is pretty straightforward; just a few connections here and there and it's done. Writing copy protection into your latest program is no easy thing and it's even more difficult if you are stuck with a tape deck.

LBPS or in it's extended version; Locomotive BASIC Protection Scheme, is Unicode's answer to the protection problem. Simply apply this protection program to your BASIC creations and it will add one of four protection techniques to it rendering it difficult to list, copy or both.

Unfortunately, the documentation is minimal. That's not to say that it needs much explaining but to have it there would be a distinct bonus. On the instructions front you get one (yes, one as in singular) sheet of photocopied paper with a few words printed in a condensed font which is hard on the eyes. Thankfully though, it does detail the methods used.

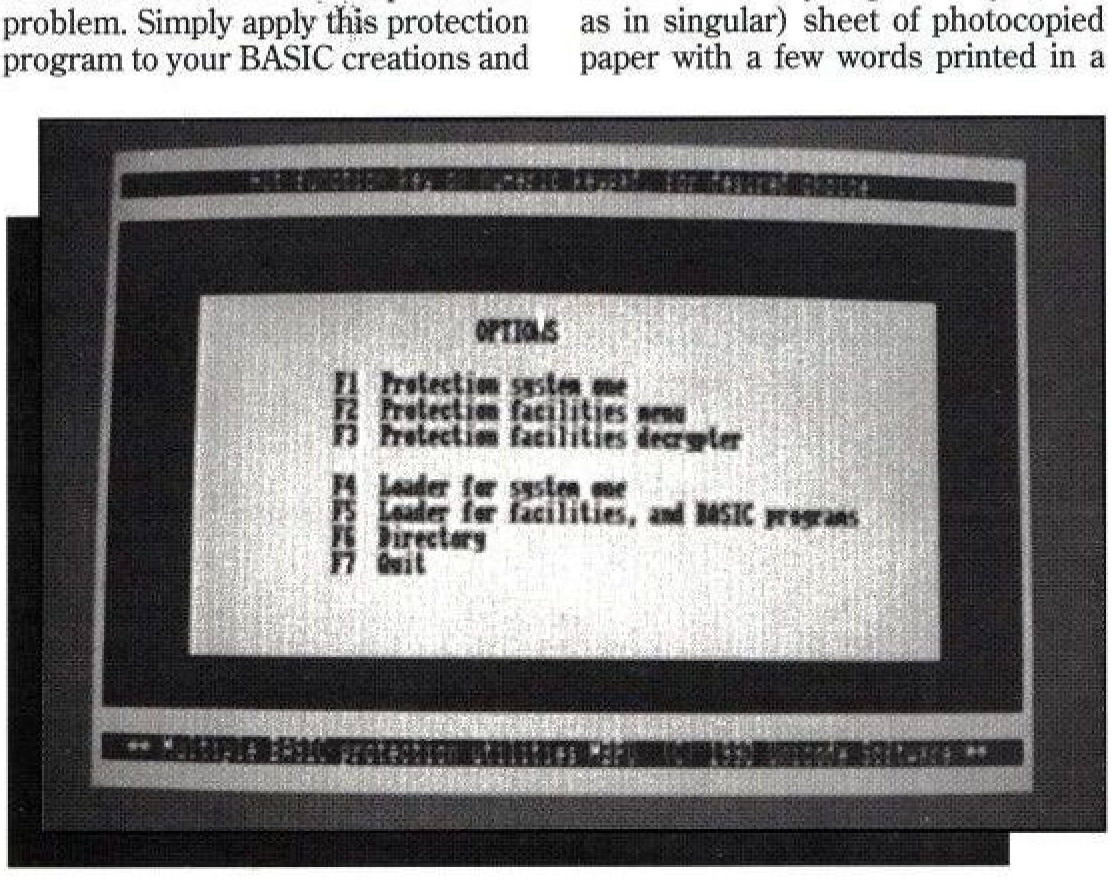
There are four different protection methods. The first encrypts the program to prevent any unauthorised listing of the program. This kind of protection is old and outdated but is still widely used among schools and colleges – it's a little too archaic to be of any real use on a CPC though.

The second method is a lot more sophisticated. This one will take one byte from a file and then rewrite to the end of that same file and replace the empty space with a new byte. Therefore, if the file is copied without the byte on the end, it will fail to run.

The third and fourth systems are well into the realms of sophistication. The third loads the file into memory at a different memory address to where it would usually reside in BASIC. It will then save it out to the address at which it was loaded with two bytes from the header being changed. This renders the program unexecutable from BASIC. The forth method is similar but a file protected with this method will not show up on the disc's directory.

From method two onwards, it's pretty clever stuff. But copy protection is really a false sense of security, someone will break it in the end. The best form of copy protection exists where the manual plays an important part in the game, not to the extent that you are required to type in a word from a page, but whereby the game can't be played to the full without the information in the instructions.

Still, until you get to the stage when you are writing commercial software, then LBPS is the answer.



DM stops off from his tour around wonderland to concentrate on the small screen scene of adventure.



Enter the Dungeon Master

After my stroll around the different formats last month, that all add up to the wonderful world of adventuring, I have decided this month to concentrate on the computer based adventure's (by far the largest group) and lead you gently into beginning your first adventure. So to everybody who has never succeeded in getting past the first obstacle in an adventure and have given up in frustration, this is just what you have been waiting for. Let's all be brave together now and get that long forgotten adventure down off the shelf, blow the dust off it, take a big breath, sneeze a lot, load the game into the computer and read…

The beginners guide to Adventuring

After loading has taken place and the back-ground to the story has been read, either on the screen or sometimes you have to read all the packaging, the computer is waiting for you to tell it what to do next. This is usually represented by a cursor flashing at you or the words "What now?" or similar appearing on the screen at the end of the text description. Golden Rule number One. Don't do anything yet!



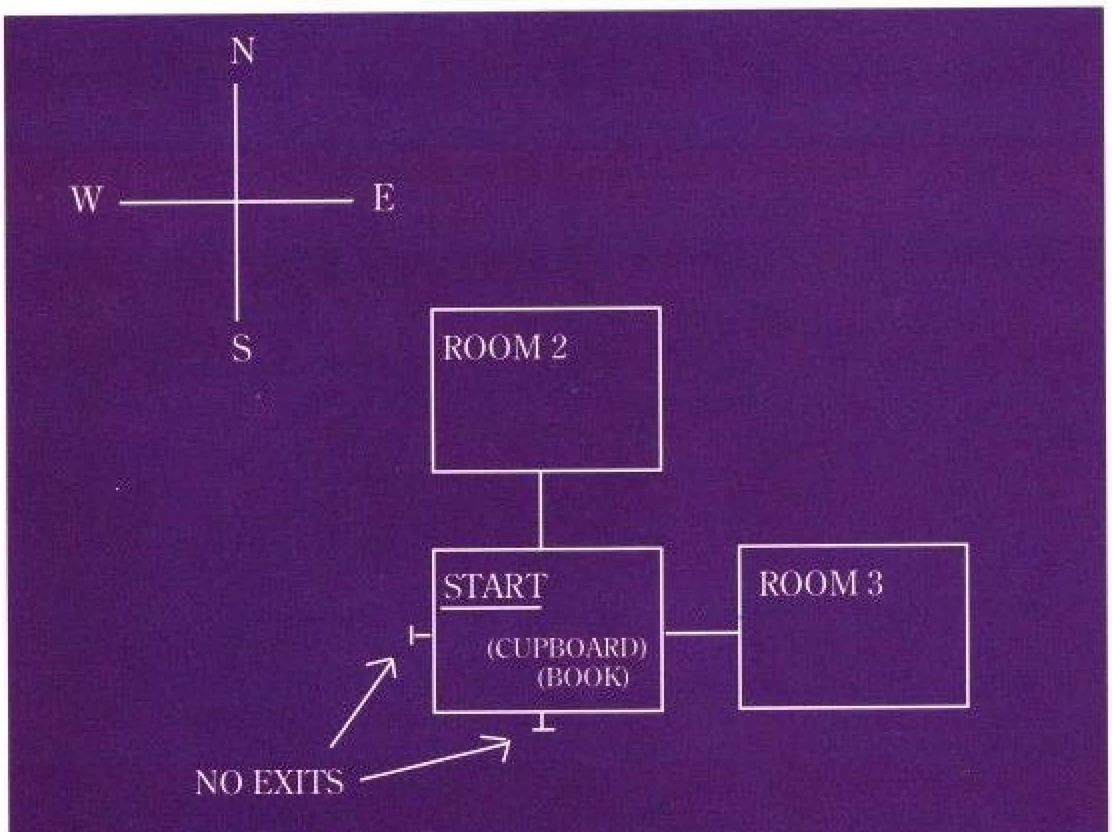
There is one word that you need to learn, if you are ever going to make any satisfactory progress. That word is EXAMINE. EXAMINE has magical powers. It can unlock mysteries, reveal objects that you never knew existed, suggest extraordinary uses for quite mundane things, and so on. Truly a remarkable word which you will find used by 95% of all adventure writers. So read the text on the screen a second time and see if anything is described that might warrant a closer look. What about that harmless looking cabinet in the corner? Try to EXAMINE CABINET and you may just discover that there is a book inside. If so, GET BOOK, then EXAMINE BOOK and you just might read about some vital information that will help you overcome another puzzle later on.

Do the same again for every object in that first room. Many times you will be told "That so-n-so is just scenery so ignore it" or even worse, just a plain "You can't". If that's the case, then it usually does mean that you can safely ignore it but it has been known for sneaky programmers to hide a proper response, until the second or third time of asking. Not a practice I approve of but it's only fair of me to warn you, that you may come across it at some time.

Right we have now examined thoroughly the first room and our fingers are itching to move to the next room but WAIT! Before we can take one step forward, we must have the means to

return to where we are standing right now. Some people say that they can rely on their memories but why bother, when making a map is so simple? Golden Rule Number Two. Draw a MAP.

The MAP is the adventurer's friend. It contains all the necessary information as to where you've been and how to get back to the correct route, after you've been led up a blind alley (literally) by a clever program. Without a map, it would usually be a case of restarting from the beginning or even worse, giving up altogether. With the aid of your map however, a quick backtrack and you're on your way again. A map does not need to be a thing of beauty, merely a collection of boxes linked together in a North, East, South, West direction, to begin with. If you try to go North and you are informed that there is not an exit in that direction, then say so on your map. I'll come back to why you should, later on.



Example of Map

So here we are, still in the first room, a clean sheet of paper and a sharp pencil in front of us, what now? Read the text again. Most adventure games provide the information as to what exits are available. An exit means the direction you can travel to reach the next room, location or destination. Adventure writers tend to call them "rooms" and players usually refer to them as "locations". The text says "There are exits to the North and East". Draw a box on our map in the middle of the page and write in the box START. This will remind us where we started from. Now draw a short line from the top of the box going north and another line on the right of the box going east. Draw two boxes on the end of each line. We now have a map showing three locations that we know exist and we haven't even moved yet. Clever isn't it?

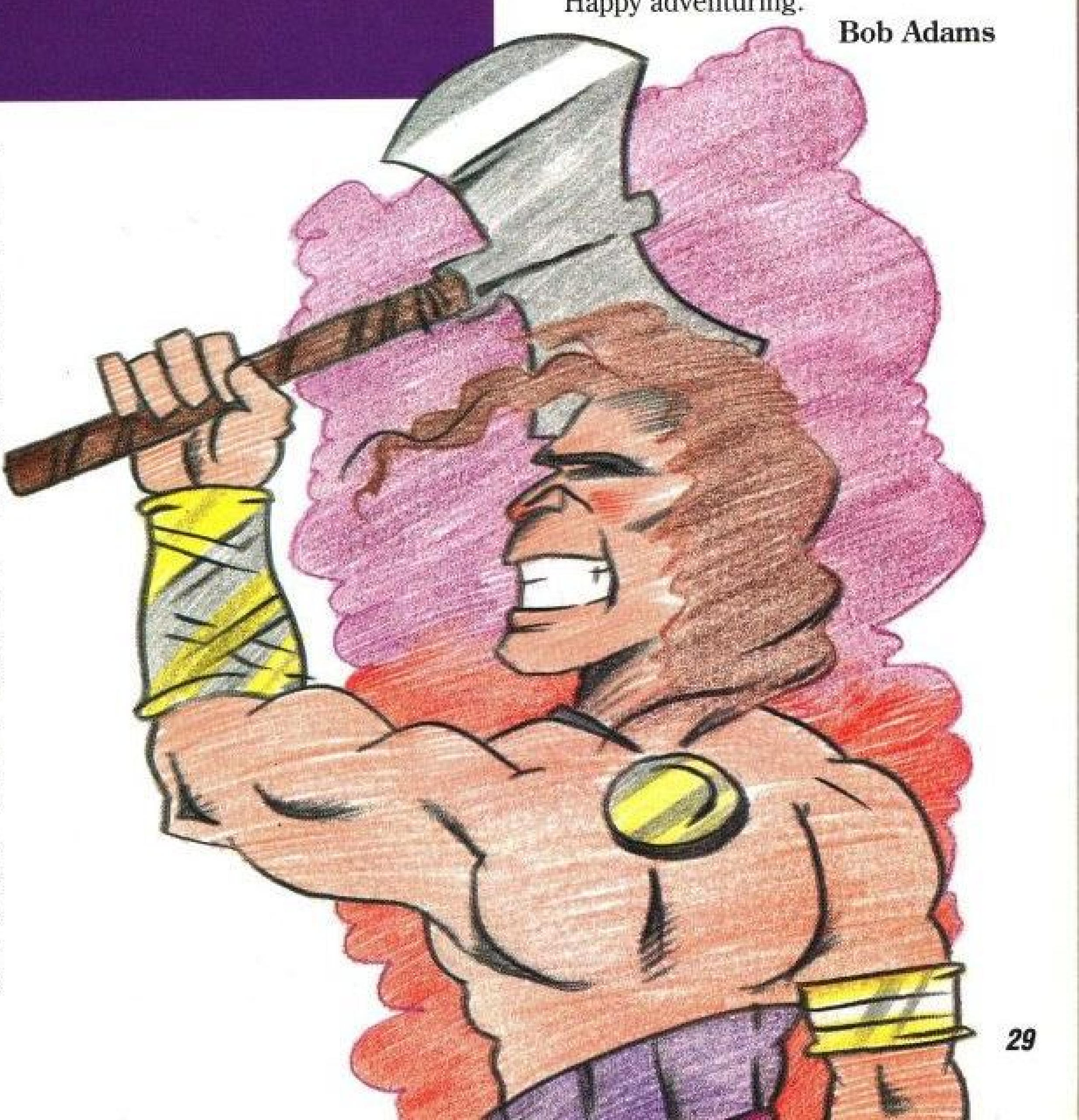
Now the moment you've all been waiting for. Type North and move to the location north of where the start location is. The screen should now fill with all the information about the new room and tell you about the objects present and what exits are available, exactly as it did for the first location. So we now do all the things we did before except for one important difference.

Once you have drawn the exits on your map indicated by the new text, type South to return to the Start location. Why? Because first, if you do in fact return to the original screen, we learn that the program is designed in a logical way. (Not all are, I'm afraid.) Second, we now have the opportunity to travel East from the start, which we may have forgotten about, had we carried gaily marching onwards from location two.

This is the method of use when I begin a new adventure. I try to map as much as possible, moving backwards and forwards, trying every exit before moving on to the next set of locations, before I even attempt to tackle an obstruction or a puzzle. Just by walking around and observing the objects to be seen (all safely recorded on the map of course), helps to make the game seem less difficult. We all still get stuck, though. That's the beauty and fascination of adventures.

Happy adventuring.

Bob Adams



BrunWord

BrunWord 6128 £30

BrunWord 6128 is a complete word processing package with word processor, spelling checker and card filing programme. BrunWord 6128 out performs all other word processors for the CPC6128. It has its own high speed screen routine, giving it a very fast screen response and the editor features are logically arranged to be easy to learn. The spelling checker, with its dictionary, load into memory at the same time as the word processor, making access very convenient and exceptionally fast. It is supplied with an introductory tutor file.

BrunWord Features

*40, 80 or 128 column display. *Touch typing speed over 200 words/min. *True insert or overwrite. *Justify or unjustify paragraph or whole text. *Justified text has balanced appearance. *Instant word wrap. *Block save, move, copy, insert and delete. *Local editing with word delete/undelete. *Adjustable margins and TABs. *Column/Line/Page display with file name. *True word count. *Find and replace. *Help menus. *Memory filing system. *Single character embedded printer commands (18 with 3 codes and 21 with 10 codes). *Page throw markers. *Multiple copies. *Odd/even page headers/footers with page numbers. *Multi file printing (new page or continuous). *Print specified pages. *Works with any printer. *True display superscript and subscript numbers. *User defined print characters. *Load/Save ASCII files from/to other word processors. *Files can be encrypted. *Maximum file size about 9 pages of text.

BrunSpell Features

*Memory resident. *Checks 4,000 words/min. *30,000 word dictionary. *No American spellings. *Add up to 5,000 of your own words. *Instant lookup. *Helps to find correct spelling. *Automatic correction.

DataFile Features

*Alphabetical, numerical, date sorting. *User defined headings. *Search routine. *Data merging. *Label printing.

Free Booklet

Our 16 page free booklet explains all about our programmes. No need to write a letter, just send a large (A4 size) SAE to 'BrunWord & Printer', Brunning Software, at the address below.

Info-Script £50

Info-Script is a complete data processing package and includes all the features of BrunWord 6128 and BrunSpell. The word processor and database can be resident together giving the speed and convenience of access to both programmes with no disc delays.

Database Features

*Very fast (e.g. takes 1 second to search 2000 addresses for surname 'Smith', initial 'B'). *Specific field search and/or progressive general search. *Instant sort on any field, alphabetical, numerical, date or reverse order (takes no time as the data does not move). *3 sets of user defined headings for each file. *4 markers for instant selection, plus one temporary marker. *Markers can be cleared or inverted and any pair can be added (allows complex searches to be quickly and easily performed). *No setting up of field type or length. *Efficient storage. *Relational records, Parents, Sons and Daughters. *Simple field to field arithmetic with running total. *Direct data merging into BrunWord. *Easy direct label printing, 1 across, 2 across, left of 2 or right of 2. *Single or multi-step.

Data Merging Features

*Simple intelligent system, &N &A &D construct full name, full address and date. *&1 &2 etc specify individual fields. *Insert or fixed format merging. *Automatic justify after merging. *Single step (see before printing) or multi-step. *Stop any time, go to word processor, restart same place. *Merge data from several records for summary, invoice, purchase order etc. *Simple arithmetic. *Running total. *Running VAT total. *Conditional loading. *Conditional printing. *Repeat patterns.

Quotes

"It may seem that I have just written a very long advert for BrunWord 6128 but I haven't, I'm just so impressed." (Phil Craven, ACU Feb 90, page 25).

"One such is Peter Brunning's BrunWord 6128 which is without doubt in my mind, the most powerful and friendly word processor available for the 6128 today, with the possible exception of.... BrunWord Elite!" (David Dorn, ACU July 90, page 43).

BrunWord Elite £55

Most word processors, including BrunWord 6128, are able to drive both daisy wheel and dot matrix printers. This creates the need for a style of printer control that is acceptable to two very different types of printers. BrunWord Elite does not have this restriction as it is specifically written to be used only with dot matrix printers. This gives it a unique advantage over other word processors and as a result it is able to provide much more advanced printer control. This is taken even further, as BrunWord Elite is supplied with an 8 Bit Printer Status Port which allows the programme to continuously monitor the status of the printer, (and provides the missing 8th bit for the original CPC6128). This enables the programme to respond in a more sophisticated way than normally possible. It will wait for ON LINE or <ESC> if the printer is initially OFF or OUT OF PAPER but automatically returns to the editor if the printer is turned OFF.

24 Pin Fonts

Before we designed the fonts for BrunWord Elite, we studied several good magazines. Fineline and Finetype are our variations of the two styles commonly used. Fineline is supplied in 3 sizes and Finetype in 2 sizes. To these we added a display font in computer style and a straightforward 'Heavy' font. Altogether there are 7 fonts supplied, 4 are full 24 pin, 2 are middle size 21 pin and one is a small size 16 pin font.

BrunWord Elite Features

BrunWord Elite has all the features and speed of BrunWord 6128 and BrunSpell, plus:-

*Print in columns *Specify page layout *Use special high quality proportional fonts *Use advanced micro justification with proportional text *Set printer margins independently *Move print head up or down paper, specified in inches from top *Set micro line spacing within text *Print line or box by specifying size and line thickness *Use absolute TABs with proportional text *Download a file directly from disc during printing. *Can be supplied with Info-Script for data merging.

Headline

Headline is a print enhancement utility for use with low cost 9 pin printers. It enables virtually all the features of BrunWord Elite, including the 24 pin fonts, to be used with any 9 pin Epson compatible printer with quadruple graphics (that's all well known modern 9 pin printers). Features include micro justification of proportional text, single, double or eight times height and 1 to 9 times width.

Comparisons

We have tested BrunWord 6128, Protext and Tasword 6128 with the same file of 3366 words.

The first test was to compare the scrolling speed of the screen, using line by line scrolling. This is a vital performance test as the CPC6128 tends to be naturally slow at this task. BrunWord scrolled 40% faster than Protext which in turn scrolled 19% faster than Tasword.

Protext was the fastest to justify but used a simple process that added spaces at the centre of each line, giving the middle of the text a bulging appearance. It did not display as it went along and so needed a separate operation to see the result. BrunWord displayed as it justified and produced the best appearance of all three. BrunWord was 30 times faster than Tasword.

Our simulated typing test achieved 218 words per minute. Both BrunWord and Protext had no trouble at this speed but Tasword was very slow inserting text into the start of a paragraph and could only handle 16 words per minute.

The spelling test checked all 3366 words. BrunSpell took 52 seconds and needed no disc changes. Prospell took 6 min 24 sec and needed 8 disc changes. Taspell took 18 min 46 sec and needed 3 disc changes.

How They Compare

	BrunWord 6128 & BrunSpell	Protext Disc & Prospell	Tasword 6128 & Taspell
Typing into 241 word paragraph Typing into start of text	218 w/m 218 w/m	218 w/m 218 w/m	16 w/m 150 w/m
Scroll to end, line by line	1 min 27 sec	2 min 2 sec	2 min 25 sec
Justify paragraph of 241 words	1 sec	0·2 sec	34 sec
Change appearance to format and Appearance to Format	17 sec	17 sec	53 sec
Spelling check 3366 words Average speed Disc changes	52 sec 3883 w/m None	6 min 24 sec 526 w/m 8	18 min 46 sec 179 w/m 3
Spelling help 'NECESERY' Spelling check word at cursor	1 sec 0·5 sec	12 sec Not possible	Not possible Not possible
Screen format - columns Page boundaries	40, 80, 128 Shown	40 or 80 Not shown	80 only Shown

9 Pin Elite

The Elite system for 9 pin printers consists of BrunWord Elite, BrunSpell, Headline, 8 bit printer status port and 7 'type setting' fonts (fonts are 24 pin in size but only for 9 pin printers). Total price £55.00 inclusive.

9 Pin Elite+Info

The Elite system as above but including Info-Script and a backup disc. Total price £92.00 inclusive.

24 Pin Elite+Info

BrunWord Elite, BrunSpell, Info-Script, back up disc, 8 bit status port and 7 'type setting' fonts for downloading to a 24 pin printer. Total price £90.00 inc.

Send cheque/PO/Access number/Visa number to:

Brunning Software

138 The Street,
Little Clacton, Essex, CO16 9LS
Telephone (0255) 862308



BrunWord 6128 with BrunSpell & DataFile. . . £30.00
Info-Script with BrunWord 6128 & BrunSpell. . £50.00
9 Pin BrunWord Elite £55.00
9 Pin BrunWord Elite with Info-Script. £92.00
24 Pin BrunWord Elite with Info-Script. £90.00
100 Letters (needs Info-Script). £15.00

Supplied on 3in Disc for CPC6128 or CPC6128 Plus.
You must state which computer.

All prices are inclusive for UK. Overseas orders sent insured air mail - Europe add £2.50 : Rest add £7.50

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ACU

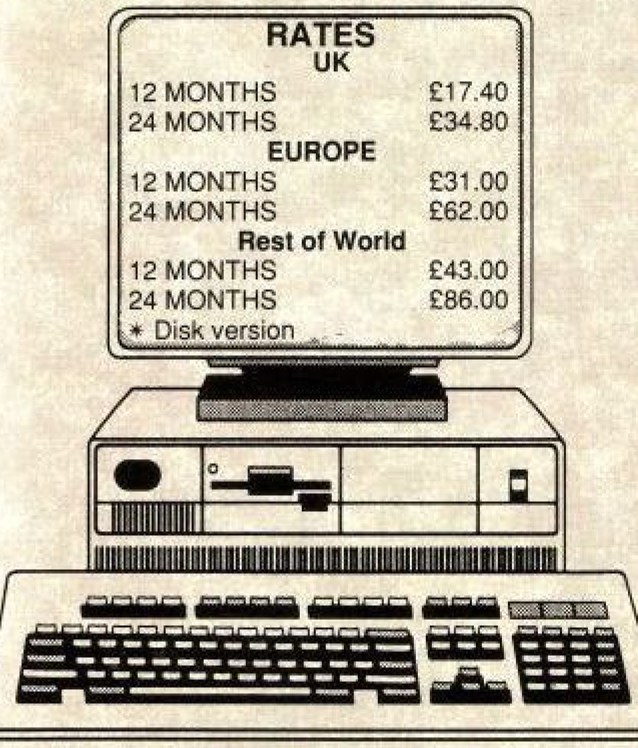
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Offer closes 31st March 1991

This month the intrepid ACU warriors don plasma shields to join Turrican in the field once more, seek out Nuke Labs with their old pal Robo, and tour the world, pen in hand, to add colour to the Turtles' holiday.

GAMEPLAN



TURRICAN 2

He's bad, he's mad and he's back with a vengeance. Any aliens out there, beware!



ROBOCOP 2

Non-stop action as Robo takes the battle to the notorious OCP.



TURTLES WORLD TOUR

Join the Teenage Mutant Heroes on a world tour of colouring in. Mega!

PLUS

Feel the need for speed in S.T.U.N. Runner, lose yourself in the epic Mastermix, test out Edd The Duck, E-Swat and take a look at some superb budget blasts hot from the Players' workbenches. Phew!

TOP 20

1	(3)	Teenage Mutant Hero Turtles	Mirrorsoft
2	(NE)	Double Dragon	Mastertronic
3	(2)	Quattro Adventure	Code Masters
4	(1)	Quattro Combat	Code Masters
5	(6)	Target Renegade	Hit Squad
6	(4)	Quattro Arcade	Code Masters
7	(7)	Out Run	Kixx
8	(5)	R-Type	Hit Squad
9	(9)	Guardian Angel	Code Masters
10	(NE)	Operatin Wolf	Hit Squad
11	(NE)	Barbarian 2	Kixx
12	(10)	Jaws	Alternative
13	(NE)	Dizzy Collection	Code Masters
14	(NE)	Golden Axe	Virgin
15	(NE)	Batman 3D	Hit Squad
16	(NE)	Yogi - Greed Monster	Hitec Software
17	(12)	Run The Gauntlet	Hit Squad
18	(NE)	Daley Thompsons SuperTest	Alternative
19	(NE)	Hollywood Collection	Ocean
20	(15)	Wonderboy	Hit Squad

Last month's position in brackets

Mastermix

Five mega Sega conversions take time off to give you plenty to shout home about.

Compilations just seem to be getting better and better value for money these days, and this little collection of Sega conversions is no exception to the rule.

Starting off with a bang, it's off to LA in the race of the century in Turbo Outrun. Travelling from city to city in a non-stop race against the clock, those of you who have dared the ever changing road conditions of this blast will know that it's a pretty good driving game in it's own right.

The scrolling might have been a tad on the slow side, but there was plenty of tense action to keep you burning up fuel to the bitter end.

Next up is Dynamite Dux, a real cute punch-em-up which has you taking on all-comers in a desperate bid to rescue Lucy from the clutches of Achacha.

Use your high-powered punch to do your dirty work til you can get your hands on some more powerful stuff in this extremely colourful game. Its fast, it's fun and as part of a compilation, it's even better value than it was to start with. Dux fans will no doubt be jumping for joy by now.

Another faithful fan club which has reason to rejoice is the SuperWonderboy brigade. Here he is in Monster Land in all his glory. Ok, so the game lacked a bit of colour, but the gameplay is superb. It's certainly one of my favourites, combining superb action with some true adventure style hints and tips at the shop.



This one is worth its weight in gold and a must for any serious gamester.

Next up is the epic bomb placing dash of Crack Down. Sixteen levels of frantic action against the Replicants in a desperate bid to blast open Dr K's fortress make this one or two player offering a real must for shootie fiends.

Last on the list, Thunder Blade, sees you up, up and away in your supercharged chopper, bombing and shooting the rebels who are overrunning your peace-loving country. Excellent graphics and plenty of non-stop blasting should keep you occupied for a fair while.

All in all, I'd say your getting a whole lot for your money with this little lot. Each of the games has its own distinctive style and what may be lacking in one game is more than adequately compensated for in another, giving a very well-balanced overall product that'll be a must, even if you've already got one or two of the blasts on the compilation.

Chris Knight





ROUND-UP			
NAME	Mastermix		
FROM	US Gold	PRICE	Disc £19.99 Cassette £14.99
86%	80%	90%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT



Turtles World Tour

Get your easel and your artist's smock and get set for something a little bit different.

Question one: What have Leonardo, Donatello, Raphael and Michelangelo all got in common? Yes, I know they're all Teenage Mutant Hero Turtles, but what else? Exactly, they were also pretty sharp artists from Spaghetti country.

So, apart from rushing through the sewers and saving the world from the monstrous Shredder, what else do they do? Yep, they paint and, with this clever offering from Electronic Crayon Deluxe, that's exactly what our younger readers can do, using simple click and go instructions from the menu.

Taking some time off from chasing Shredder, the dudes are taking a world vacation, landing them in all sorts of unlikely locations. The only trouble is, whoever took the snapshots forgot to load a colour film.

As a result, when you leaf through shots of the heroes scaling Mount Everest, or taking time out to explore the Great Wall of China, it's up to you to pick the right colours to liven them up.

Using the handy crayon shaped cursor, you can use the joystick to choose which location you want to paint, from the White House and the Statue of Liberty, through Stonehenge to the Australian Outback.

At the bottom of the screen you'll find the paint palette with a selection of 16 colours to make sure you get the bandannas just right. If you're still not happy, just click the crayon on the mix key for some more alternatives.

Keep experimenting and, if you get it wrong, just click on the oops! option to erase the last segment you coloured in. If you get bored with the picture you are painting, just click on stop and start again.

All in all, there are 30 pictures to colour in, each with a special educational description in the manual supplied with the disc, to let you know exactly what the dudes are up to.

Read through them and then it really is up to you. Should Stonehenge be bright red? How about giving the Acropolis a nice green tinge?

When you've finished, just rub out your picture and you can start all over again.

Turtles World Tour won't appeal to everybody but, as stated on the box, for the 4-12 year olds, it's both great fun as well as being educational. Having said that, however, once the ACU team got hold of the box it was a fair few hours before I could get hold of it to have a go myself.

The graphics on the completed pictures are bright and bold and might go down well on a screen dump if you have a colour printer.

Way to go, Dudes!

Brad Fisher



ROUND-UP			
NAME	Turtles World Tour		
FROM	Electronic Crayon Deluxe	PRICE	Disc £14.99 Cassette £9.99
88%	N/A	85%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT



Robocop 2

Robo's back in another thrill-packed battle with the notorious OCP.

If you enjoyed the first thrilling instalment of Robo's adventures, then this one's going to blow your mind. Combining action sequences of epic proportions and puzzles to set your mind reeling, Robocop 2 is an excellent example of the extra facilities available on the Plus range.

Starting off at the beginning, where else, Robo's task is to locate the Nuke Lab at the River Rouge Sludge Plant. From the very first, you've got a struggle on your hands. Avoid the hammer pins, the pitfalls, the electricity bolts and a whole host of other hazards on your way to making a few well-timed arrests during your hunt.

Timing on this level is essential and you'll need to take a fair few turns before you master each move and jump.

While Robo is out on the chase for villains, OCP has managed to slip a few confusing directive changes into his circuitry. As a result, levels two and five will have you fuming as you desperately try to find the memory chips which will bring back Robo's full power.



There are 32 to find in all, in order to complete four separate circuit boards. As you guide your cursor around each board, you'll have to plan well in advance, in order to avoid being cut off by burnt tracks. Watch out for the directive chips as well, or you'll end up where you started.

To help Robo maintain his perfect scores, levels three and six will see you down at the shooting gallery. Move the gunsight around the screen and blast away the criminals without harming any civilians.

As you move on to the hazards of the Tokugawa Brewery and ultimately, OCP Civic Centrum, the action really hots up, culminating with the final battle with the beast itself-Robocop 2.

Throughout the game, the graphics are stunning. Scrolling is smooth and you can pick up a fair bit of speed along the platforms.

There are seven levels in all, each of which is cunningly thought out to provide a real challenge with gripping gameplay. You'll be able to complete it, but not without some real effort and cunning of your own.

The music also provides just the right atmosphere to keep you glued to Robo's progress and, even if it does take you a while to master the first level, you'll want to keep on going until you succeed. Get to that final battle to the death at OCP Central and you'll know it's all been worth it.

ROUND-UP			
NAME	Robocop 2		
FROM	Ocean	PRICE	Cartridge £24.99
90%	88%	97%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT

Fasten your seatbelt, clamp yourself firmly into your Spread Tunnel Underground Network craft and get set for some hair-raising action as you pick up speeds of up to 900 MPH underground.

This is the 21st century and Grand Prix racing just doesn't fit the bill any more. Instead, you must arm yourself to the teeth and throw yourself at lightning speeds through the STUN tunnels in a bid for the ultimate title.

Right from the start of this smart offering, the clear graphics give you a good impression of how the game is going to handle. Scrolling





S.T.U.N. Runner

Race towards the ultimate challenge in a chilling 21st century chase against time.



through each of the different tunnel segments is fast and smooth giving a real feel for the speed of your machine.

As you progress, keep your eyes open for the green stars. Follow them and you'll not only pick up handy bonus points, but you'll also be on the fastest possible route. On top of that, if you get enough stars, you can get your hands on a shock wave which will destroy everything in their path. very handy.

Like a bobsleigh run, you can use the outside walls of the curves to your advantage, but make sure you keep an eye on any obstacles in your path.

Along the way, you'll encounter trains on the tunnel floors, fast moving Mag Cycles, Drones to block your path, indestructible armoured drones and, later on, Flyers, which will do their very best to bomb you out of sight.

Basically, it's up to you to clear your own path. If you can't do that, make a beeline for the turbo Boost Pads. Land on one of these and you'll find yourself flashing as you approach light speed.

At turbo speed, you can pass safely through any objects in your path, though as you slow down again, you'll have to gauge when your invulnerability ends.

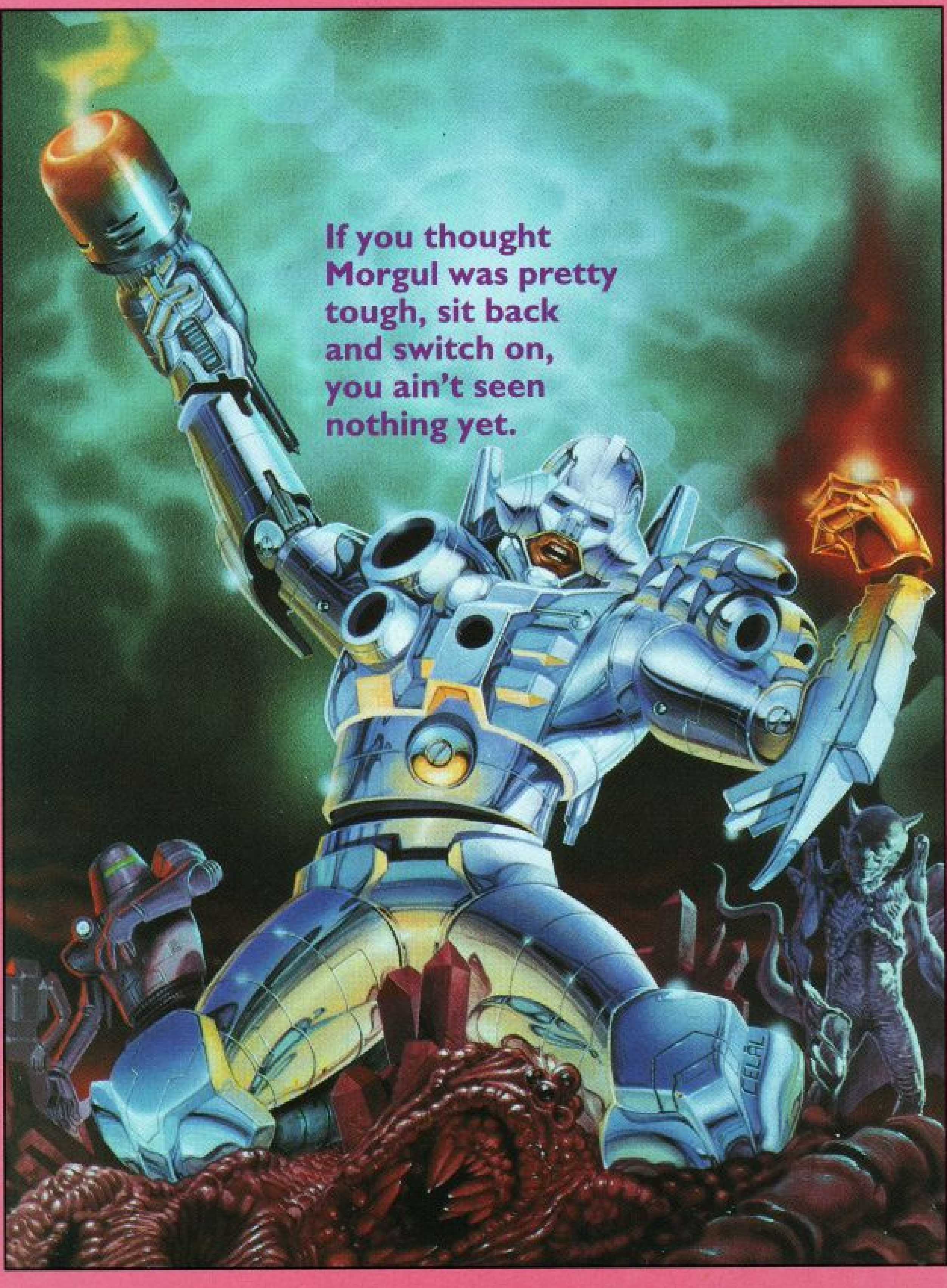
All in all, there are 24 levels of tunnel network for you to test, including a very useful practice run. Each of the networks is progressively harder, with more and more targets to be found within your viewfinder. The earlier rounds may seem simple enough, but it sure gets tough as you make your way to the top.

As a futuristic race game with a difference, runner is well worth getting hold of and, with the sheer scale of the tunnel network, it should keep you busy for some time.

John Taylor

		ROUND-UP	
NAME	S.T.U.N. Runner		
FROM	Domark	PRICE	Disc £14.99 Cassette £9.99
80%	79%	84%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT

Turrican 2

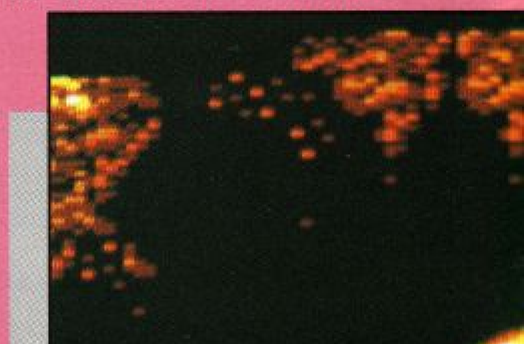


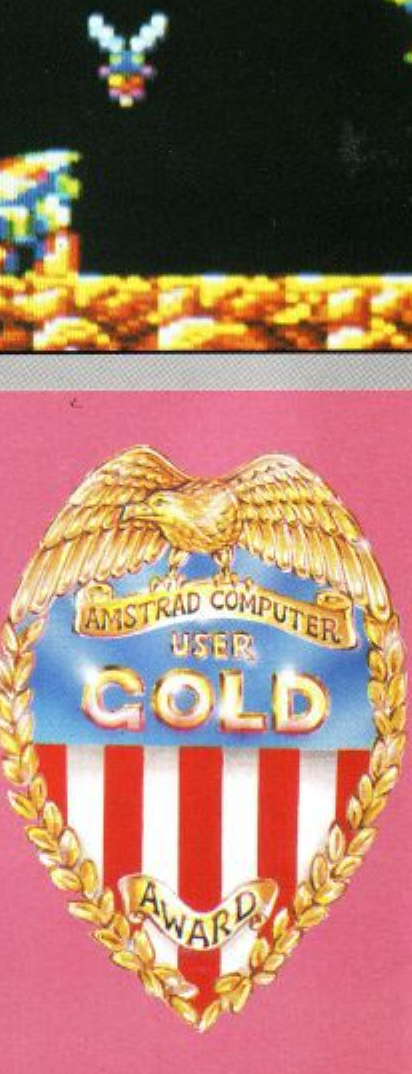
Turrican, the original, was a scorcher.If you haven't played it yet, or read through ACU's super cartoon walk-through of the game, you don't know what you're missing.

When you get a game of such a high standard, it's usually very difficult to repeat that success, but there's no worry on that account with Rainbow Arts' epic Turrican sequel.

Fresh from blitzing Morgul, you receive an intergalactic distress signal from the ancient planet of Landorin.In that long-distant world, the brave freedom fighters had long ago destroyed the evil hordes of the tyrranical MACHINE and its satellite station.

However, despite the removal of the false moon, the machines still roamed the







planet, forcing the Landorins to take to the subterranean cave systems.

Before too long though, the mutants and the mechanoids found the secret entrance to the underground refuge and only death awaited the brave fighters unless, of course, a hero could be found to save the day.

Yes, Turrican is that hero and it's your task to get in there and take on the evil legacy of the MACHINE.

Over five separate worlds, with a total of 12 different levels, Turrican 2 is a monster of a sequel from the word go.There's more action, the graphics are simply superb and there are even some excellent speech samples mixed in with the sound effects.

To make matters even



neater for us CPC freaks, the programmers at Enigma have studied every last detail of the Amiga version to guarantee that the gameplay on this 8-bit format is virtually identical to the 16-bit.

Basically, if you can do it on the Amiga, you can do it on the CPC and, if you can't on the Amiga, the same goes for Arnold.

In World One, you find yourself on the surface of the planet taking a real beating from the natural elements, such as wind and waterfalls.The Walkers should keep you occupied for a while, but the best way of dealing with them is to jump on them, squash them flat, hear them squeak and then watch them run away.

After despatching with the nasty end-of-level meanie, World Two will see you puzzling through an overground maze and beating off mutant hordes at the same time.Drop down into the water and you lose your turbo laser, but the graphic effects of this multi-scrolling bubble world are stunning.



Get to World Three and you'd better be set for some real action.Climb aboard your space craft and get blasting at high speeds.Guiding your craft through the twists and turns of Tecno World is hard enough, without the task of having to blast the enemy to bits at the same time.

Using incredibly fast parallax scrolling, Tecno World is buzzing with pure blast-em-up action, while World Four will see you slowing right down to a real mental challenge similar to the last world of Turrican 1.

As you puzzle to find a way through the labyrinth, you'll need to pick your way with some care.Some of the blocks around you can be moved or destroyed, others can't and can be fatal.There may not be too many of the enemy in sight here, but if you don't make it through in time, the end result can be just as nasty.

If you've still got control of your joystick arm by this stage, you're doing very well indeed, but you'll need to be better to finish off the final world.

The first level sees you once more in the 'Alien' style landscape of the original game, though this one is far bigger and slimier and, if you thought the end of level guardian in the original was tough, try the new one for size, it's not pretty and it's no pushover.

Succeed and you're off to the final showdown with a particularly gruesome mechanical monstrosity.

Set over a verticallly scrolling backdrop, keep your trigger finger well-oiled in a duel to the death that ain't easy at all.

So there you have it, an arcade-style bash that Rainbow Arts has spent a long time in getting just right.You should be able to finish off the first couple of Worlds after a few attempts, but the later Worlds will require some practice, hitting just the right balance to make you want to keep right on going until you succeed.

If you liked the action/challenge mix of the original, Turrican 2 must be on your shopping list for your next set of full-priced games.The graphics are superb, the varied music and sound effects are excellent and, above all, the gameplay is gripping.

Gather up the weapons of the ancient people of Landorin and free their planet forever.The gauntlet has been well and truly thrown down.

Brad Fisher

ROUND-UP			
NAME	Turrican 2		
FROM	Rainbow Arts	PRICE	Disc £14.99 Cassette £9.99
92%	90%	96%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT



E-Swat

Wear your badge with pride in the thug-infested streets of Cyber City.

You certainly picked the wrong time to become a rookie cop in downtown Cyber City. The crime rate is soaring and cop killing is becoming a favourite pastime for the criminal element.

So what are you going to do about it? Your best. That's all you can do. Starting off as a regular member of the Special Weapons and Tactics squad, your first duty is to get out on the streets and show your superiors that you're up to the job.

You're on your own. Watch out for the neat sequences as you pull up in your squad car with your sirens blaring, then go do your stuff.

This 'stuff' consists mainly of strutting down the streets taking potshots at anyone who comes near you, be they skateboarding hoodlums or knife-throwing maniacs.

Finish off three levels and you get your promotion to the E-Swat team, picking up the special cybernetic exo-suit and laser cannon to go out and do more of the same.

Surviving the first three levels is not over difficult. Just remember to pick up the spare ammo lying around, dodge and weave a bit, and you'll soon find yourself facing the end of level bad guy.

Kill a couple, rescue a damsel in distress and you're through. As you progress into the E-Swat squad, things do hot up a bit, as the hoodlums bring out the heavy armoury. Be sure to avoid the grenades, or a few hits could lead to the mortuary.

The game itself contains some pretty neat graphics, but doesn't provide too much of a challenge on the early stages. As a pure shoot-em-up, E-Swat will certainly give you plenty of opportunity to vent your anger against your opponents, but the scrolling isn't really fast enough to create the tense atmosphere to go along with the storyline.

Try and keep some distance between yourself and the bad guys. If they come in too close, you can't get your gun up in time and fire off those all important rounds.

When you can, make sure there's somebody there to shoot at, otherwise you'll run out of ammo and find yourself in a real jam.

So there you have it. Not a bad example of a horizontally scrolling shootie, with a couple of platforms thrown in for good measure, but nothing to sell your hamster for.

Brad Fisher



ROUND-UP

NAME	E-Swat		
FROM	US Gold	PRICE	Disc £14.99 Cassette £9.99
78%	76%	72%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT

Edd The Duck

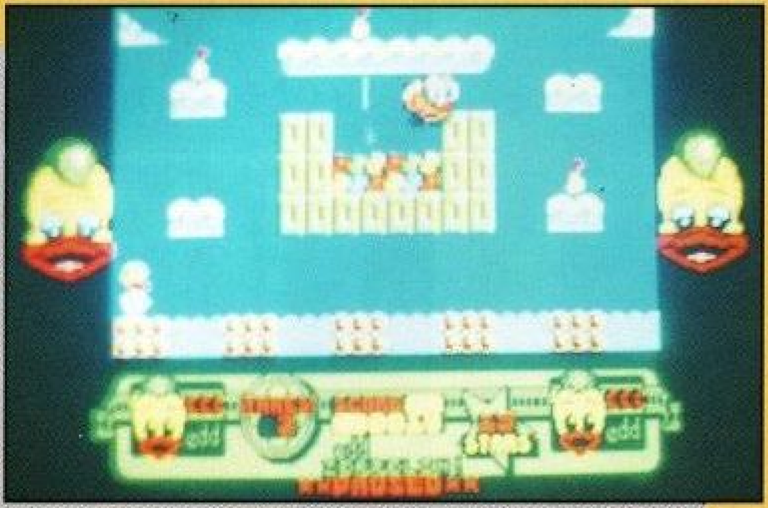
As if we didn't have enough superheroes, in flaps another on the wings of TV success.



Old Edd's been around a bit over the last few months. If he's not appearing on Childrens' TV, he's out at some charity do somewhere or other.

Well, if you haven't seen him recently, it's probably because he's been at the software house trying to blast away the opposition in his latest role as Computer hero.

To be fair, and considering the excitement levels of this game, perhaps Edd would have been wiser to stay off the small screen and on the TV screen.



The game itself consists of nine episodes set over three levels located within BBC TV departments. In his quest to become an even bigger superstar, Edd has to battle through the Weather studio, the Special Effects studio and, of course, the riotous Childrens' TV set.

On each level of this vertical scroller, Edd's task is to collect 20 stars which will allow him to progress to even better things. But, yes, there's always a but, in order to hinder his progress, Edd's arch-rival Wilson the Butler has sent in his cronies and they come in all shapes and sizes.

Ok, so what's Edd got up his sleeve to even things out a bit? Well, he's got this mega Snowball Shooter to despatch with the bad guys. Unfortunately, the shooter only temporarily stuns his opponents instead of killing them. All very tasteful, I'm sure, but just when you think you've got a level beat, up jump the baddies and out goes Edd.

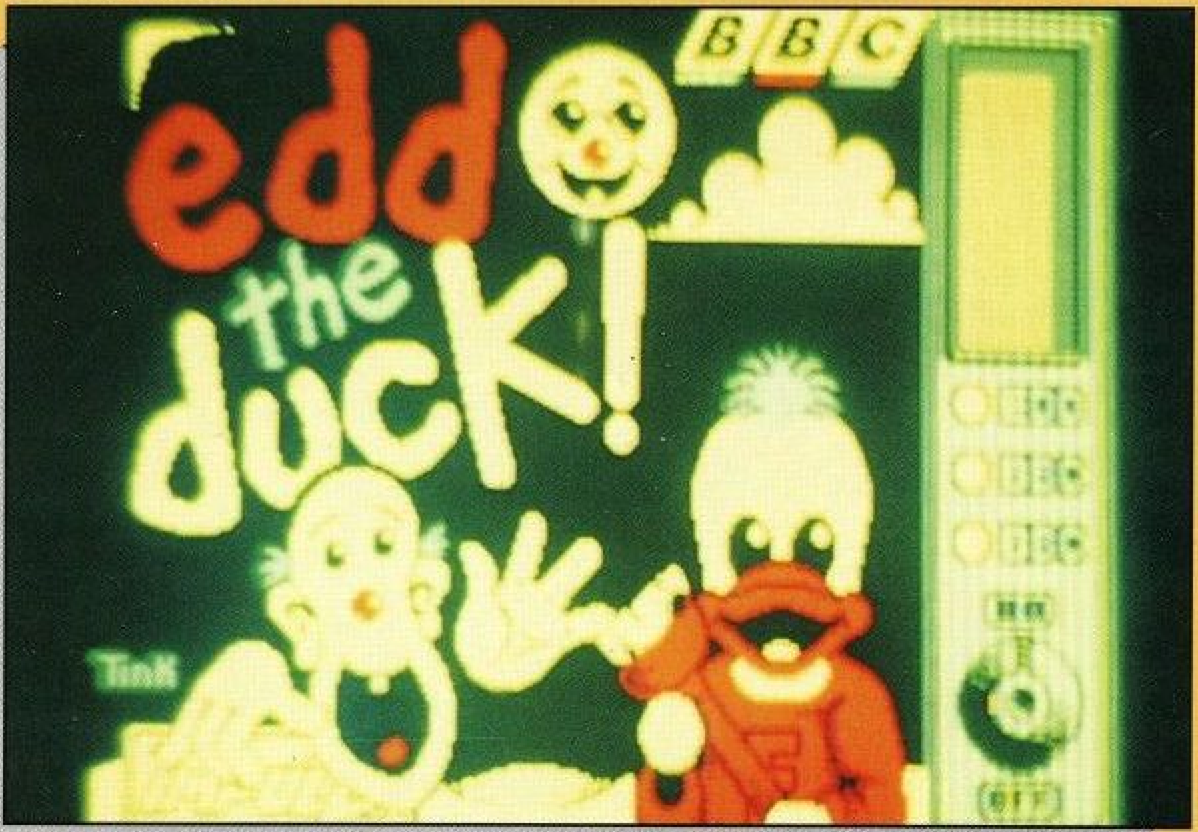
You start off the game with four takes, or lives, and losing those is a fairly easy task if you're not careful.

So there you have it. Once you've got your first 20 stars, it's off to the second level and pretty much of the same thing really. Although the faces of the bad guys do change, watch out for the Arglefrogs in particular, the action gets a little repetitive.

The vertical scrolling isn't bad, but not being able to change direction mid-jump can be fatal. Lose those four takes and it's back to the beginning.

Edd the Duck is fun as far as it goes, but for lasting interest in the playability stakes, it might be advisable to stick to that old gem of vertical scrollers, Flimbo's Quest.

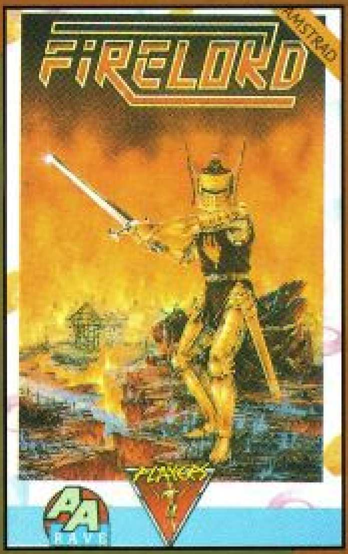
John Taylor



ROUND-UP			
NAME	Edd The Duck		
FROM	Impulze	PRICE	Disc £14.99 Cassette £9.99
68%	70%	68%	
GRAFFIX	SONIX	PLAYABILITY	VERDICT

Budget Basement

Cast your eyes through a fine selection of budget goodies hot from the Players' workshop.





FIRELORD

Be of brave mind, Sir Galaheart. Go out into the wilderness and find the Sacred Firestone and return it to the dragon's safekeeping.

Sounds like a harmless enough mission, but once you set foot into the land of Torot, you'll be dumfounded by the scope of this excellent adventure as well as the gameplay. On your way to seeking out the Enchanted Crystals, which will help you to solve the puzzle of Torot, you will meet a whole population of inhabitants.

Some are peaceful and may be able to help you. Others don't mean you well at all. Use all your wits to seek out information, trade, barter and even steal to get what you want.

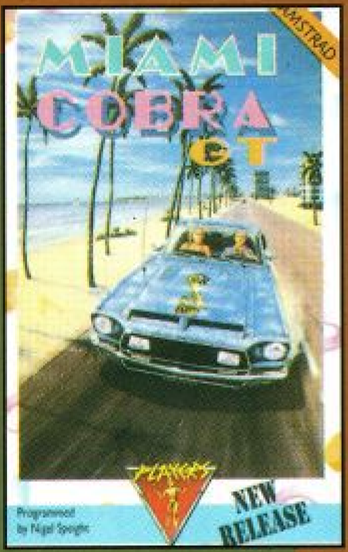
As a budget offering, Firelord should appeal to action and adventure freaks alike. With over 500 different locations, you're sure to be kept busy for some time, during which, you won't have time to get tired either. Try it, you won't be disappointed.

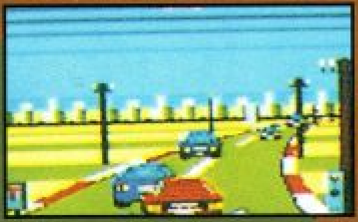
MIAMI COBRA GT

On a completely different tack, get set for some excellent 3D parallax scrolling race action in your two litre Mustang Cobra under the searing Florida sun.

You've been challenged to a head to head race and, of course, you can't turn it down. Over eight gruelling levels, each with four stages, it's non stop burning rubber, through mountain ranges, inner city landscapes and tree-lined avenues.

On each stage of this marvellously crafted race, you get eight turbo boost charges, to





bring you right back to the head of the field if you've had the misfortune to lose control.

Getting used to the car may take a little time, but once mastered, it's a joy to play. The graphics are clear, there's a nice soundtrack and, above all, it's fun. Don't miss it.

IMPOSSABALL

Moving on to something weirder, use all of your powers of coordination to guide your Impossaball through eight levels of 3D mazes and corridors.



The idea is to squash all of the cylinders you find in your path by bouncing on them while, at the same time, avoiding the many obstacles in your path.

Touch a spike and bang goes your ball. Touch a column and you'll find yourself reeling with the shock. You'll also find Plasma Fields and Fire Bolts scattered around the maze, which should be skirted at all costs.

Impossaball is infuriatingly good fun and you'll need to be very quick indeed to dance out of the way of destruction. Look out for the magic rings that can offer you much needed extra lives but, be careful, they can also deal out death.

As with most puzzle oriented games, the simpler the idea, the better the game and, true to that maxim, Impossaball is a challenge you'll want to come back to again and again.

RANA-RAMA

Last, but by no means least, in this little selection from Players' Collectors Edition series, is the magical powerplay of Mervyn, the sorceror's apprentice who's managed to turn himself into a frog.

Set over eight levels of dungeon, your task is to explore each room, take on warlocks by engaging them in ritual combat and finally gain enough spell power to resume human form.

Over the first four levels of this excellent offering, progress isn't too bad, as the warlocks aren't over-



powerful. However, each is guarded by his own evil minions, so you'll have to wade through that lot before you can reach your prey.

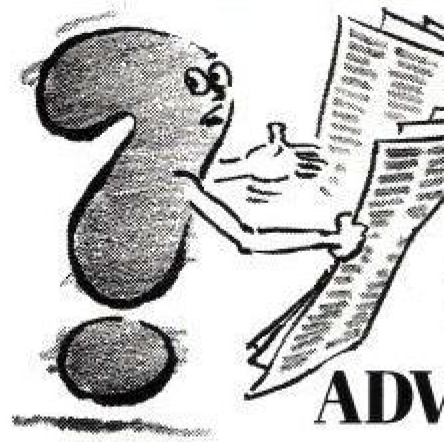
Some of the rooms you enter will have mysterious symbols carved into the floor, which can be used to enhance your spell power or show you where you need to go.

Get onto the last four levels and you begin to meet up with some pretty wicked necromancers. Tough going indeed.

All in all, Rana Rama is an excellent combination of adventure, action and puzzle. With some cute graphics and a nice, atmospheric soundtrack, it's excellent value for money on the budget label.

Chris Knight

Firelord	Players	£2.99	86%
Miami Cobra GT	Players	£2.99	80%
Impossaball	Players	£2.99	88%
Rana-Rama	Players	£2.99	90%



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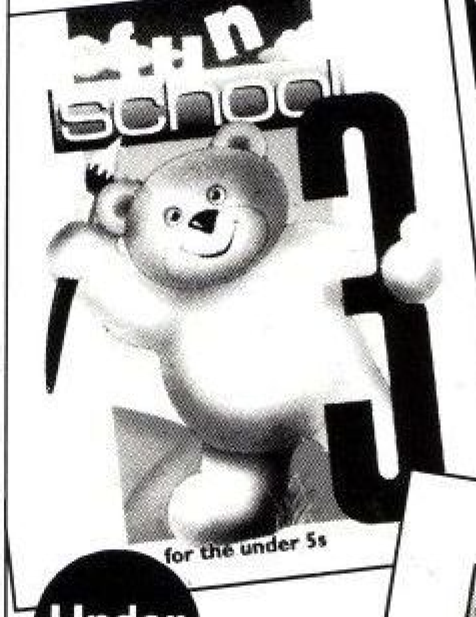
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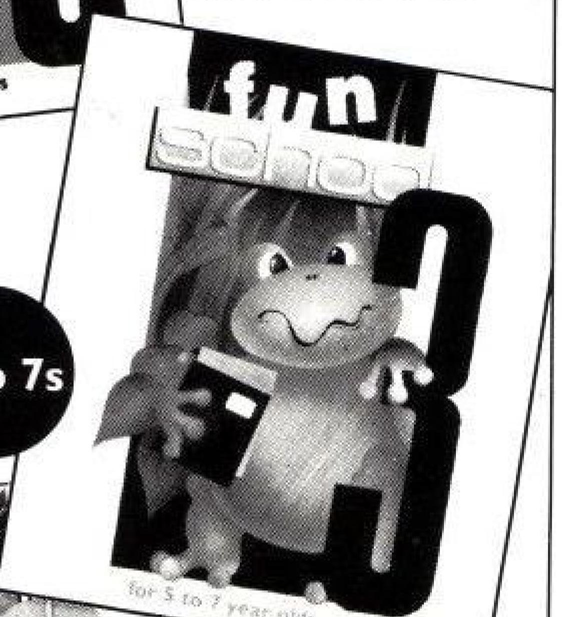
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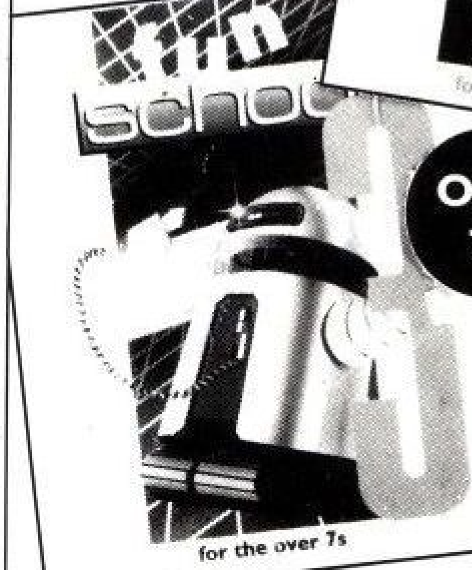
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DATABASE EDUCATIONAL SOFTWARE

All systems go

The mystery surrounding disc operating systems dissolves as John Hudson begins a step by step guide to CPM/+.

Most people who have heard of CP/M know of it as the first important operating system for microcomputers. But those who have never used a 6128 or a PCW know it in version 2.2. Version 3 – or CP/M Plus – was hardly taken up until Amstrad supplied it with the CPC6128 and PCW8256 in 1985. CP/M Plus is one of the best operating systems for microcomputers. It was a vast improvement on version 2.2 with features which make it unique among microcomputer operating systems.

The need for a standard 'Disc Operating System' (or DOS) arose when removable (or 'floppy') discs became available for microcomputers. People wanted to be able to distribute software on discs which would run on any machine. CP/M offered a way of doing this and also made it easier to connect printers, modems and other peripherals to the computer.

As CP/M was developed, more features were added to the 'disc operating system' part of CP/M. I will try to explain what they do and why, in some cases, they make CP/M a better disc operating system. If you have a 6128 Plus, load CP/M from your system disc (your backup, not the original!) and enter

```
DIR [full]
```

Something like Figure 1 should appear. CPC 6128 owners will get a slightly different list. After the size of each file in bytes and the number of records, there are always two 'attributes', normally 'Dir' and 'RW'.

'RW' stands for 'Read/Write' which means that anyone can do anything with the file, including deleting it. You will know from the instructions that come with blank discs that you can 'Write Protect' the whole disc so that files can be read but not changed or deleted. However, this mechanism applies to all files on the disc. CP/M allows you to make a single file 'Read Only' and the 'RW' attribute becomes 'RO' (Figure 2).

If you have Mini-Office II, put the disc in drive B: if you have two disc drives, or keep it handy if not, and enter

```
DIR B: [full]
```

If you have one drive, swap the discs when you are asked to put in the disc for drive B: and then press a key. You should see something like Figure 2. Don't worry if it is not exactly the same; there are different versions of Mini-Office II. All but two files have 'Sys' instead of 'Dir' and all have 'RO' instead of 'RW'. The two files with 'Dir' are the files you see if you use the normal AMSDOS command 'CAT' (for 'Catalogue') at the BASIC prompt. AMSDOS displays

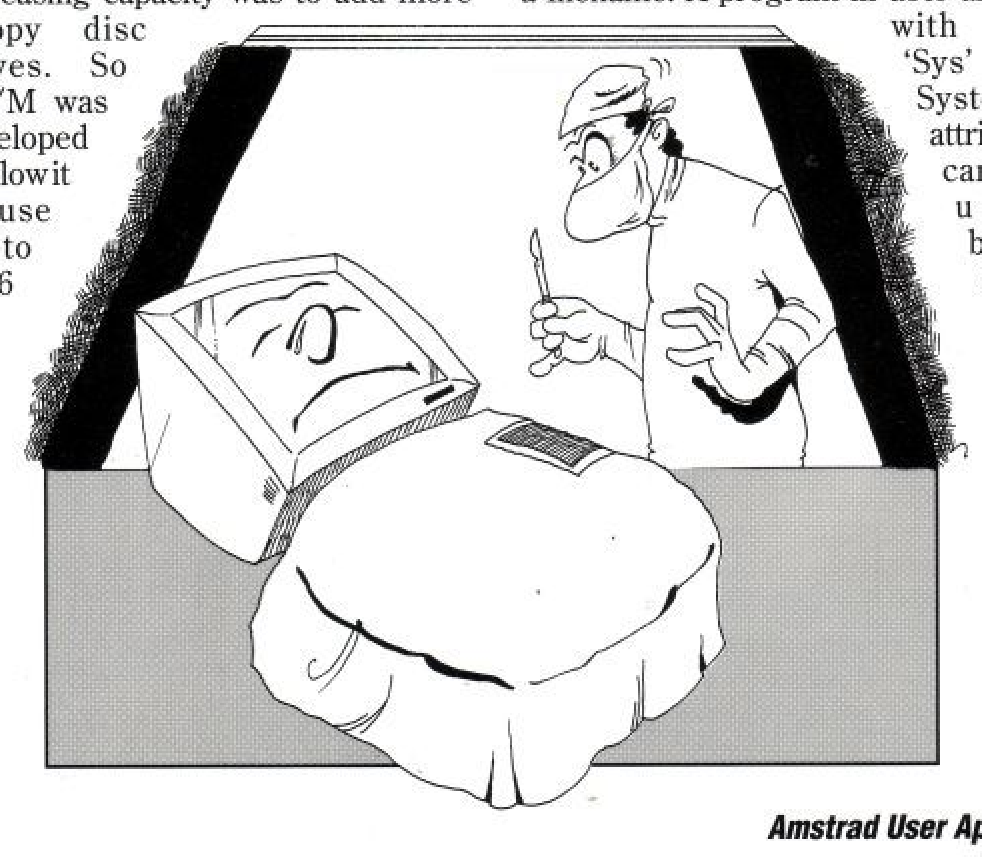
```
CONVERT BAS* 1K
OFFICE BAS* 1K
OK free
```

acknowledging they are 'Read Only' files by adding the asterisks. To explain 'OK free' and 'Sys' a bit of history is needed.

In the era BA (Before Amstrad) when computers and disc drives were really expensive and there were no high capacity disc drives, the only way of increasing capacity was to add more floppy disc drives. So CP/M was developed to allow it to use up to 16 disc drives labelled A: to P:. With all this money invested in disc drives, people wanted them to be accessible to more than one person. So Digital Research, the company responsible for CP/M, came up with MP/M – a multi-user version of CP/M – through which 16 users could share a single processor and up to 16 disc drives. Each user was allocated a 'user area number' between 0 and 15 which gave the user access to all the files in this 'user area' on all the disc drives and to programs in the 'system area'. MP/M never caught on but the concepts of 'user areas' and a 'system area' were built into CP/M.

In fact, there are no such 'areas' on the disc; files belonging to a particular 'user area' are identified by the 'user number' which is put in front of the filename in the place where CP/M looks to see if a file has been deleted. Deleted files have the number '225' in this position. So when CP/M is looking for files on a disc, it only looks for those with the current 'user number'. If you are in user area 3, for example, only files with user number 3 are displayed in response to the CP/M command 'DIR' (for 'Directory').

Large computers have one or more 'system operators' who keep an eye on the 'system area', loading programs or languages as they are needed for different jobs. Digital Research incorporated the idea of a 'system area' into MP/M. As with the user areas, there is no such 'area' on the disc, merely an attribute to a filename. A program in user area 0 with the 'Sys' (for System') attribute can be used by any of



the sixteen users without it having to be in their user area. So when you ask MP/M or CP/M Plus to run a program, it first looks for that program with the current user number and, if it doesn't find it, looks for a file of the same name with user number 0 and the 'Sys' attribute. It ignores files with user number 0 and the 'Dir' attribute unless the user is in user area 0.

If you use DIR to list files in user area 0 and there are files in the system area, CP/M Plus adds the message SYSTEM FILES EXIST at the end of its response to DIR. If you then use DIRS (for 'Directory of System Files'), you can see which these are. Neither CP/M version 2.2 nor AMSDOS have an equivalent command but AMSDOS knows the 'Sys' files are there and includes them in its calculation of free space – hence the 'OK free' message in the case of Mini-Office II.

WARNING: 'Sys' files have nothing to do with 'system discs' or 'system formats'. You can have 'Sys' files on a data format disc.

So what use is all this? Well, anyone with a hard disc will know that a display of 1024 files isn't the easiest list to search. So early hard-disc systems – such as the ICE for the Apple II – used CP/M disc drive labels to 'partition' the disc and make filing operations easier.

However, other operating systems – such as MS-DOS and UNIX – have adopted a tree structure with a 'root' directory, sub-directories, sub-sub-directories, sub-sub-sub-directories and so on (Figure 3). Theoretically this offers users more possibilities for 'grouping' files than CP/M but there are two disadvantages to a tree structure. Firstly, it encourages people to group files around programs rather than around activities and, secondly, it makes copying files between 'groups' more difficult.

For example, to move data from a spreadsheet or a database in one sub-directory to a report in another sub-directory involves a detailed knowledge of the tree structure, or 'directory paths', of the particular disc you are using. Those who think CP/M's PIP command is for masochists should try and get to grips with MS-DOS directory paths!

With CP/M Plus, files can be grouped by activities so that all related files are in a single user area. With word-processor, database and spreadsheet programs all in the 'system area' instead of in separate sub-directories as in MS-DOS, files do not have to be

Figure 1 Screen response to DIR [full]

Scanning Directory...
Sorting Directory...
Directory For Drive A: User 0

Name		Bytes	Recs	Attributes	Name		Bytes	Recs	Attributes
AMSDOS	COM	1k	8	Dir RW	BANKMAN	BAS	1k	7	Dir RW
BANKMAN	BIN	2k	12	Dir RW	C10CPM3	EMS	25k	200	Dir RW
DATE	COM	3k	23	Dir RW	DEVICE	COM	8k	58	Dir RW
DIR	COM	15k	114	Dir RW	DISKIT	COM	6k	48	Dir RW
ED	COM	10k	73	Dir RW	ERASE	COM	4k	29	Dir RW
GET	COM	7k	51	Dir RW	KEYS	CCP	1k	3	Dir RW
KEYS	WP	1k	3	Dir RW	LANGUAGE	COM	1k	8	Dir RW
PALETTE	COM	1k	8	Dir RW	PIP	COM	9k	68	Dir RW
PROFILE	FR	1k	1	Dir RW	PROFILE	SP	1k	1	Dir RW
PROFILE	UK	1K	1	Dir RW	PUT	COM	7k	55	Dir RW
RENAME	COM	3k	23	Dir RW	SET	COM	11k	81	Dir RW
SET24X80	COM	1k	8	Dir RW	SETDEF	COM	4k	32	Dir RW
SETKEYS	COM	2k	16	Dir RW	SETLST	COM	2k	16	Dir RW
SETSIO	COM	2k	16	Dir RW	SHOW	COM	9k	66	Dir RW
SUBMIT	COM	6k	42	Dir RW	TYPE	COM	3k	24	Dir RW

Total Bytes = 148kTotal Records = 1095 Files Found = 30
Total 1k Blocks = 148Used/Max Dir Entries For Drive A: 31/ 64

Figure 2 Mini-Office II disc directory

Directory For Drive B: User 0

Name		Bytes	Recs	Attributes	Name		Bytes	Recs	Attributes
BOOT	BAS	1k	5	Sys RO	COMMSC	MO2	22k	170	Sys RO
COMMSD	MO2	6k	48	Sys RP	CONBVOOT		BIN	2k	9 Sys RO
CONMEN2	BIN	1k	8	Sys RO	CONMENU	BIN	1k	8	Sys RO
CONVERT	BAS	1k	4	Dir RO	DBCON	BAS	4k	32	Sys RO
INTERCPT	BIN	1k	3	Sys RO	KNIFE	BIN	5k	40	Sys RO
KOHLRABI	BAS	90k	720	Sys RO	MEN	BIN	3k	17	Sys RO
OFFICE	BAS	1k	2	Dir RO	SPRCON	BAS	4k	25	Sys RO
STAMP	BAS	7k	56	Sys RO	WORDA	BAS	6k	48	Sys RO
WORDB	BAS	22k	170	Sys RO	WORDCON	BAS	1k	8	Sys RO

Total Bytes = 178k Total Records = 1373 Files Found = 18
Total 1k Blocks = Used/Max Dir Entries For Drive B: 25/ 64

transferred between sub-directories as in MS-DOS. Instead, the database or spreadsheet program can be loaded from the 'system area' and, when the necessary data has been output, the word-processor can be loaded to complete the report – all without ever leaving the relevant user area. Indeed, CP/M Plus encourages good computing practice by allowing you to keep your data in user areas separate from your programs which can be called from the system area at any time.

One way of looking at CP/M's user areas is as sixteen workspaces, none of which can normally communicate with each other – all of which can communicate with programs with user number 0 and the 'Sys' attribute (Figure 4). But this is also misleading because both MS-DOS sub-directories and CP/M user areas are dynamic – that is to say, a sub-directory or a user area is only as big as the files in it. If you add more files it grows in size; if you delete files it shrinks. The only limit is that the total number of files or the total size of all the files in all sub-directories or user areas must not exceed the limits for the disc as a whole. In general, if you have a 720K disc drive or a hard disc, you are better off using CP/M user areas. A hard disc partition is always a fixed size – a user area grows and shrinks as necessary.

But here the similarity between MS–DOS and CP/M Plus ends. Every

Figure 3 Possible MS-DOS tree structure

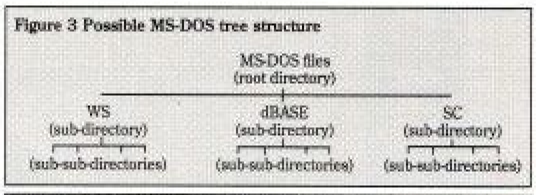


Figure 4 Conceptual map of CP/M user areas



time you want to add or remove a sub-directory in MS-DOS, you have to issue particular instructions. With CP/M Plus, user areas are 'created' or 'removed' simply by leaving a file in the user area or deleting all files in the user area.

Note that the 'system area' and 'user areas' spread across all available disc drives; so any program in the 'system area' on drive A: can be used with files in any user area on any drive. Files in user area 3 on drive B can be used with files in user area 3 on drive A: but NOT with files in any other user area.

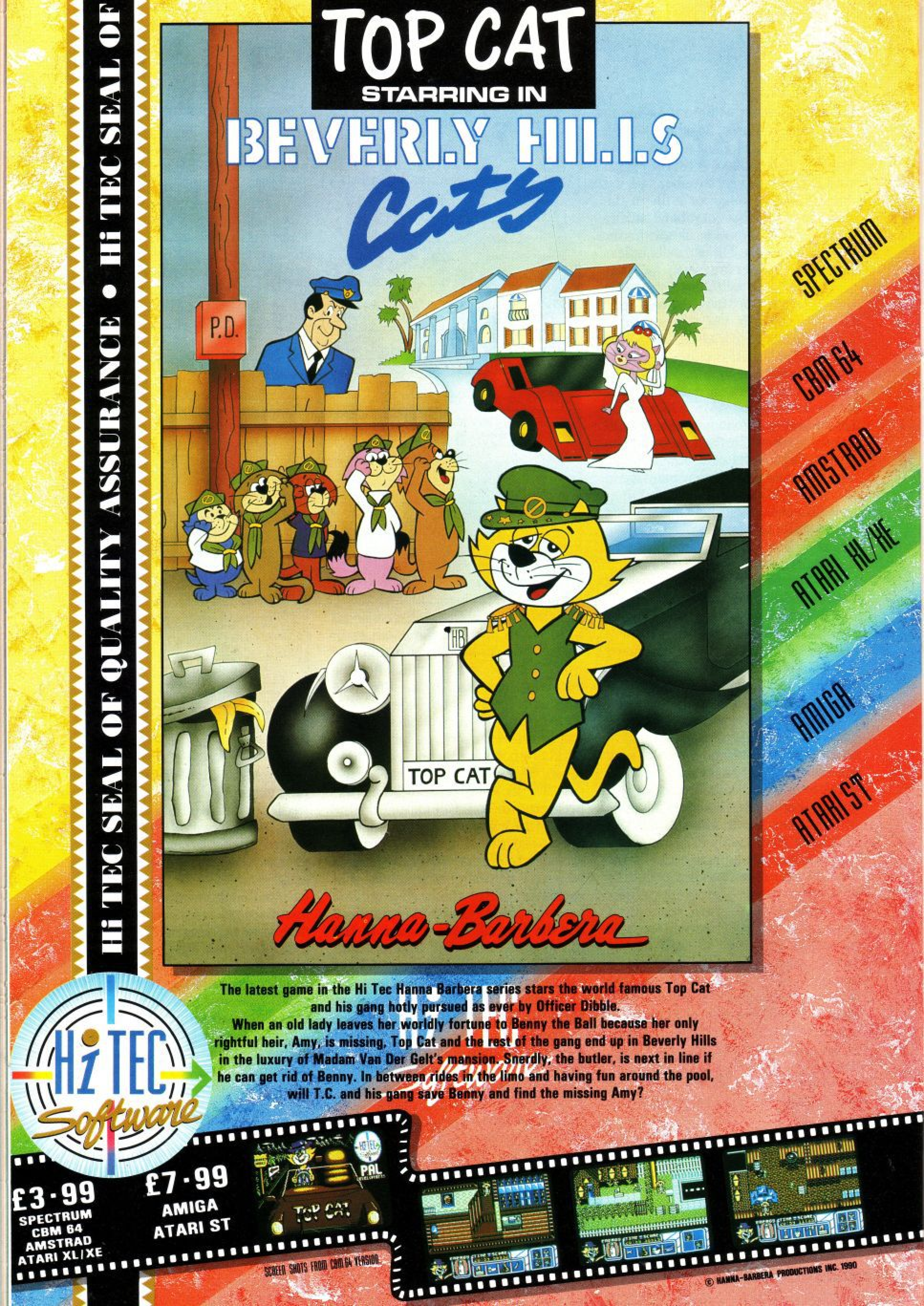
If you want to give any of your programs the 'Sys' attribute, you need to use SET.COM. Load CP/M from the system disc; then enter

SET d:filename.ext [sys]

where 'd:' is the drive and 'filename.ext' the name of your file. To make individual files 'Read Only', enter

SET d:filename.ext [ro]

More on that next time.



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Graphically Yours

In which Gordon discovers a neat PD package that makes CPC modemising much more enjoyable and pretty – much like himself, really!

Things certainly are moving apace in the CPC comms world at the moment. Regular users of Maxwell House will know that there is now an ANSI sub-set emulation available for our beloved machines. Now, for those of you that have no idea what I'm on about, or why I should get so excited about this, here's a leetle explanation.

I think everyone knows what the ASCII character set is, don't they?? If you're not sure, type the following little proggyette into your CPC and run it.

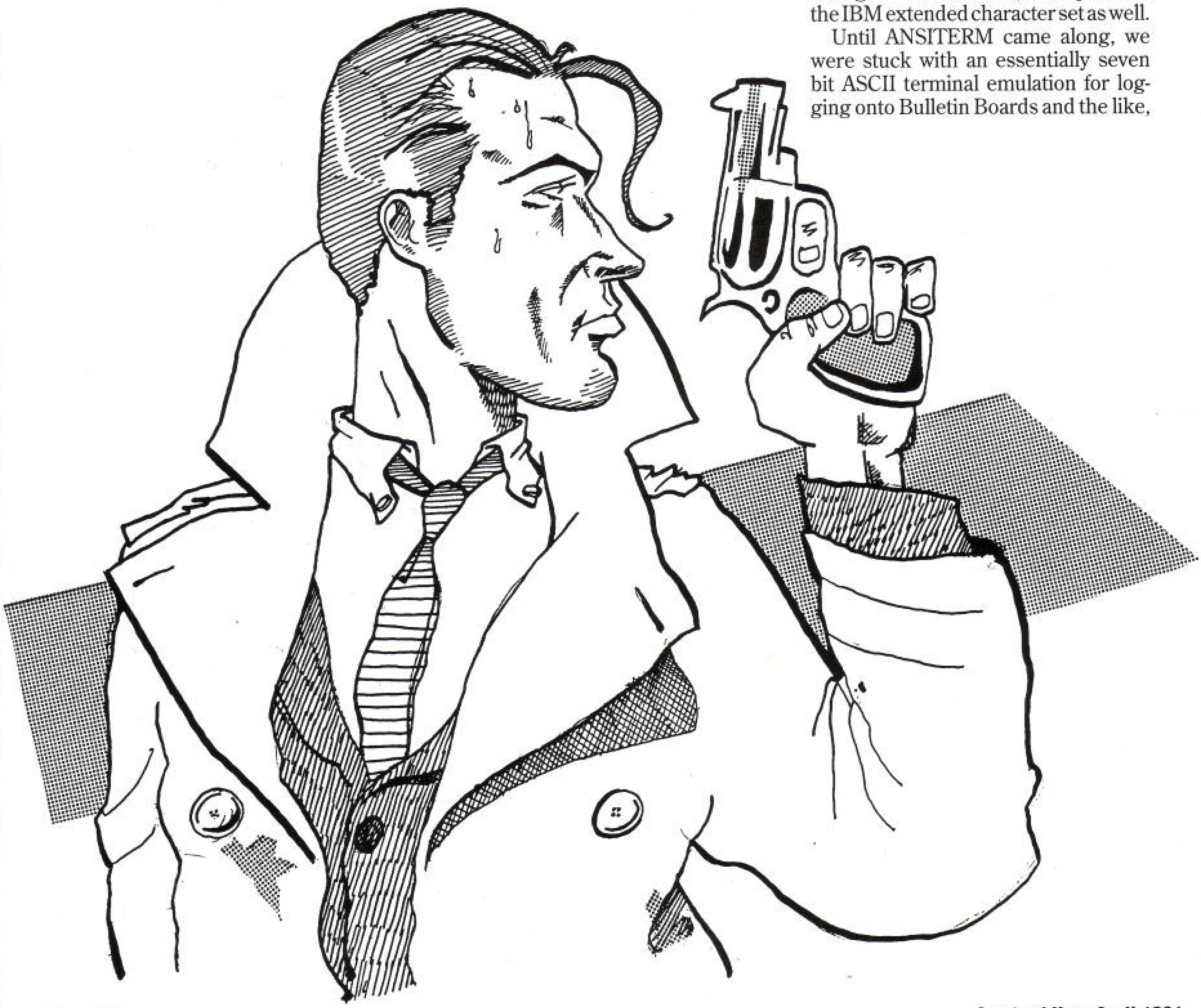
```
10 FOR n=32 to 128 STEP 1
20 PRINT "Character ";n;" is ";CHR$(n)
30 FOR wait=1 to 3000:NEXT wait
40 NEXT n
```

What it does is display the printable ASCII characters that the Arnold has burned into its ROM. If you like, the ASCII character set is a seven bit character set – think about it, it only takes seven binary digits (techy stuff, this) to come up with value up to 128. The first 32 characters (0 to 31) don't print – they've got control functions to perform.

Now, the ANSI set extends the ASCII set from 128 to 256, and more or less conforms to the IBM extended character set. These are mostly graphics. However, the ANSI standard also contains cursor positioning and other codes to do with colour and so forth. This is what I get excited about.

You see, the CPC in mode 2 can't display any colours beyond the two you've got set – it's essentially monochromatic (yeah, I know, you can have pink on yellow if you like, but you know what I mean), but it CAN respond to cursor positioning codes, and, given the right circumstances, can reproduce the IBM extended character set as well.

Until ANSITERM came along, we were stuck with an essentially seven bit ASCII terminal emulation for logging onto Bulletin Boards and the like,



and had to make do with line editors in their messaging sections.

Line Editors?? You MUST have seen them! If you make a mess-up, you have to recall the line that it's on, there's no hitting the old cursor keys and moving about your text. Under an ANSI emulation, though, that's exactly what you CAN do – it's like having your fave wordprocessor onscreen.

If you're still not convinced that this is a GOOD THING, then consider this. These days, very few BBS systems run a 7 bit ASCII system (you might otherwise know it as TTY, or teletype). Unless they're running under CP/M (and they're in the minority) the likelihood is that the BBS will be ANSI based. Sure, there'll be concessions made to TTY users – all the scrolling systems I'm involved with make both TTY and ANSI available to users, but, and it's a big but, if you're in an ANSI emulation, it automatically covers you for TTY as well, since TTY can be considered a small subset of the ANSI standard (or ANSI is a development from TTY, if you want to be pedantic about it!)

So, if you use an ANSI emulation, you won't get the screensful of what appears to be garbage (the ANSI control codes) should you specify the wrong access method to Maxwell House, or whichever BBS you use. (and it also means my bruvver won't get zillions of messages telling him the thing's bust, when it's just that people have hit the wrong key before the BBS sets itself to the emulation it wants to use.)

And so to the application itself.
Ansiterm runs under Amsdos, unlike most other reliable comms software, and is purely a terminal emulation – there are no file transfer facilities built into it at all, although that's due to change, I hear.

It's actually available (on Maxwell House – 071 828 1577) as a .ZIP file, which contains the .BIN program and a short documentation file. CPCUNZIP.-COM is also available – you'll need it if you haven't already got it. Once you've unzipped the pair of files, a read through the documentation (all one screen of it) tells you all you need to know. ANSITERM is called by the usual RUN"ANSITERM, and a very quick message flashes onscreen.

No - I haven't been able to read it – I can't get my fingers to hit the "ESC" key quick enough! Anyway, once it's loaded, pressing <CONTROL><TAB> pops a little banner line up giving you a choice of speeds. Happily, ANSITERM supports up to 4800bps (Bits per Second), and includes 12/75 <spit>.

I've used it with an Amstrad SM2400 modem, but you should have no problems using it with a manual dial modem - it simply connects as soon as you boot it.

IN USE
I've used ANSITERM at all speeds up to 2400bps, and I'm chuffed with it. Using MEX, I've had all kinds of problems with the faster speeds and character losses - due to an unsuitable modem driver, I'm sure. To some extent, the same happens with ZMP, but I see there's a new overlay for it, which I'll be downloading in the next few days to see whether it makes any difference. With Ansiterm, I've had no such problems – no character losses, no weird looking symbols all over the place, in fact, it looks just like a nice mono PC screen.

There are one or two little funnies, though. The cursor takes the form of a 'V', and occasionally gets left onscreen in places it shouldn't when you're looking at an animated ANSI screen. 'Animated?' I hear you cry?? Yup – this ANSI stuff is the bee's knees, folks. Remember I mentioned cursor positioning codes a bit earlier? Well, using them, you can move the cursor (in a jump) and overwrite the ANSI characters that are at the screen position (remember that <space> is a character as well – CHR$(32), actually).

By so doing, you can make screens move, and all kinds of things - check a few BBS systems out – even Maxwell House has an animated logoff screen. You've been missing out on ALL of this before now!

Anyway, back to the plot. The 'V' cursor sometimes gets left behind as a character, but, strangely, doesn't interfere with line lengths or anything like that - no doubt it'll be fixed before long.

And that, really is the size of it. It's PD, so costs nothing (although a fiver to the author won't go amiss), effective, and makes you wonder why somebody didn't write it ages ago. I expect that its author, Paul Martin, will continue to refine and add to it, until it's got Zmodem and ASCII up and downloads in it, dialling directories, and more. I certainly hope so. Paul – if you're reading this (and I hope you are) give yourself a great big clap on the back from me.

The rest of you - if you're into comms at all, get yourself onto Maxwell House or any other BBS, come to that, and get Ansiterm downloaded. If you want to do file transfers, make a note of which files you want and boot ZMP to go and get them when you've finished with the messaging.

In the meanwhile, I'll try to sort out a way of interfacing the two programs so that file transfer is built in - that's if Paul doesn't beat me to it!! (and I hope he does - he's a much better programmer than I am).

Now to other things. I mentioned a Multi User Game a while back, called SHADES, running on Micronet amongst other places. Since then, a number of messages have found their way to me asking whether there's any targetting software for the CPC, and, up until today, I hadn't found any. Lemme explain targetting to you.

Each player on Shades has a persona name - it might be Koppatop or Fluffs, or BigNose, or whatever. The thing is, Fluffs might attack Koppatop with the Long Sword, and Koppatop might want to STeal it off her to RETaliate with. You'll note I've capitalised certain letters, and for a reason. To attack Koppatop, Fluffs would need to type

K KO LS

Koppatop would then type

ST LS FLU

to steal the sword. If he managed to get it first time (unlikely), he'd then need to type

RET LS

and so it would go on – each STealing and RETting, but having to type ST LS FLU a few times before the Long Sword finally gets nicked. Enter the computer as it should be – why not let it remember what you just typed, or, even better, have set phrases stored in the function keys, and a facility to change the name while your battling – hence Targetting software– you make (in my case) DIptheria (shortened to DI) the target.

Thus, an Fkey might have

ST LS @ stored in it, and the program be able to replace the '@' with DI after you've told it that that's who you're battling. Such software exists, but it has been written for another game than Shades. I'll be downloading it from Maxwell House, and, next month, after I've altered its FKey settings, I'll let you know how it copes with Shades in Scrolling mode– I'll also tell you how to alter it yourself, to customise it to the way you play the game.

That's it for this month. I'll see you round the systems – even if you don't see me!!!

Tara!!!!

BITS 'N' PIECES

For Sale

OVER 50 ORIGINAL AMSTRAD GAMES, including Monty Python, Laser Squad, Bloodwych and Lords of Chaos. Worth over £450, will sell for £175. Telephone 0480 811045 and ask for James.

DMP 2000 PRINTER. Good condition with Amstrad lead or ST lead. £50. Ring 061 799 8504 after 6.00pm any day.

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ANY GAMES you can't get? I can get most games, even out of production ones. For details send SAE to T. Keevil, 14 Pytchley Close, Brixworth, Northants NN6 9EW.

CPC464, green monitor, 260 games, lightpen, speech synthesiser, joystick, magazines. Worth £1400, sell for £225 o.n.o. Also CPC6128 colour monitor, 30 disc games, joystick, MP3 for £325 o.n.o. Phone Paul 021 4221858.

CPC6128 for sdale, including colour monitor, over £600 worth of software and equipment plus Multiface II and mouse. Contact 0502 722833. £500 o.n.o., great buy.

FREE, 24 copies of ACU, either collect or py postage. Phone 051 722 1407.

DK'TRONICS speech synthesiser trom and sound booster (464 only). Hardly used £15. Telephone 0603 427622.

SILICON DISC, (DK'Tronics) for Amstrad 6128. Large 256K capacity, acts as drive B or C. Boxed, with manual. Fast storage system retailed at £130, accept £40 o.n.o. Telephone 0294 79229.

WantedSwaps

DECENT MACHINE CODE TUTORIAL books wanted for the CPC. Also wanted an adventure writer such as Gac or Quill. B. Saunders, 78 Margeholes, Carpenders Park, Watford, Herts WD1 5AR.

MULTIFACE II required. I will swap with a Lubital 2.25" square twin lens reflex camera and case in A1 condition. Phone Bob 0202 398445.

BARDS TALE for Amstrad on disk badly wanted. Please contact Johnathan Emmett, Imberhorne Farm, East grinstead, West Sussex, RH19 1TX or phone 0342 321093. Thanks.

EXCHANGE Pandora and Pipe Mania (disc) for Soft968 Firmware Manual. Also Homebrew software wanted with right to distribute, (Sprites Alive games etc..) Enclose SAE for return disc/tape. R. Dillon, 70 Highfern Gardens, Belfast, BT13 3RE.

WILL SWAP Total Eclipse and Sphinx Jinx for Game Set and Match II and Operation Thunderbolt or the Hollywood Collection. Also swap Combat School for Chase HQ. Telephone 0272 789913.

ONE of Power Drift, Chase HQ, Ghostbusters, ast Ninja II to swap for Rick Dangerous or Bloodwych. Any two for Sim City or Monty Python. Ring Simon on 0909 475105.

GEMINI DATABASE 1984 instruction manual please. Also Database Software 1986 "Planit" personal organiser program and manual. Will pay fair price or swap perhaps for CPC 464 colour cassette.

BEGINNERS GUIDE to machine code book wanted. Will swap for Easi Amstrad tape. Any hints or tips on machine code gratefully accepted. J. Smallshaw, 85 Wetherell Road, Victoria Park, London E9. 081 533 3793.

DOES ANYONE out there have a copy of Mastertronic's Amaurote or Firebird's Empire on cassette which they want to sell. Contact P.L. Ramsay, 37 Earby Grove, Blackley, M9 2LL.

THEY STOLE A MILLION wanted on disc for sale or swap. Also wanted Dizzy, 1,2, or 3 maps, hints, tips. Phone Bob on 0923 675281 after 2pm.

I WOULD APPRECIATE HELP in search of Maxam 1.5 and help in how to use it. Also wanted, poke for Arkanoid. Contact Martyn Hanson, 4 Maytree Lane, Waterthorpe, Sheffield S19 6HA.

Services

HELP OFFERED ON all aspects of BASIC and assembly language programming. Don't forget to send an SAE. Sean McManus, 226 Chertsey Rise, Stevenage, Herts. SG2 9JQ.

CONVERT your 464 to 6128. Keep 464 equipment and buy 6128 programs. Both will work. Microchip conversion carried out. All you need is disc drive. Example Stop Press DTP on 464. Contact R.J. Amison, 56 Drubbery Lane, Blurton, Stoke-on-Trent. 0782 318548.

I HAVE STARTED A BUSINESS for people who want tailor-made programs for all CPC's. Also, does anybody have a Firmware guide for the 464 to lend. Contact Mr Manning, 9 Steerforth Street, London SW18 4HH.

Fanzines

CPC FANZINE called Play Mates. Issue six due early Feb, full with reviews, tips, pokes and Bonzo news with P&P just £1. Carl Surrey, 37 Fairfield Way, Barnet, Herts EN5 2BQ.

AOK Fanzine, issues 2 and 3 out now, includes features, reviews, type-ins, small projects and more. Send 60p (includes P&P) to Paul Escott, 31 Colebrook Road, Shirley, Solihull, West Midlands B90 2LB.

That's it for this month folks. As you can see, we've been up to our necks with your responses so far for this new service for yourselves and this is only the beginning.
Don't forget, this service is absolutely FREE to private readers. All you have to do is fill in the coupon below and we'll make sure that your ad. gets into the next available space.
Don't forget to keep on sending in your programs for the PIECES section. So far, the response has been staggering, so as soon as we've evaluated some of those excellent proggies, you'll see them on these pages. Til then, keep up the good work.

AMSTRAD COMPUTER USER
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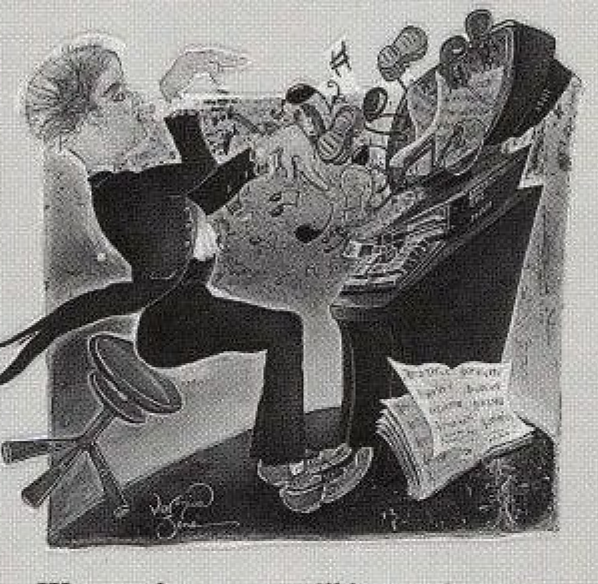
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Playing the Amstrad

In which Waughy gets to grips with the CPC as musical instrument, and has immense problems getting it under his chin!!

The introduction of sound chips into personal computers brought about the birth of a totally new musical instrument – the computer itself. How easy and effective it is to play depends both upon the hardware and the software used to drive it.



The Amstrad as a musical instrument

Most musical instruments are designed to be ergonomically easy to play – within the confines of the shape required by the instrument to produce whatever sound it is supposed to produce. A piano type keyboard is probably one of the best examples although designs exist for other keyboards which are intended to be easier to play.

Computers, unless they are specifically designed to operate as a musical instrument, are not normally supplied with a musical keyboard and if we want to play the computer we must make do with what we have, ie the QWERTY typewriter keyboard.

Depending on your musical upbringing, you may find this easy or difficult to adapt to. The QWERTY keys are not laid out like a piano keyboard and are not labelled to correspond to musical notes, and it may well be that the non-musician has a distinct advantage over the keyboard player.

If you play a keyboard, your playing will tend to be partly automatic and after a little practice your fingers know how to move in order to play a certain sequence of notes. Much the same applies to the typist who is used to the QWERTY keyboard but in this case the fingers are responding to different patterns, ie word patterns, not musical ones.

Musicians and non-musicians alike will find that a little practice greatly improves their skill in using the QWERTY keyboard as a musical instrument but it will still be difficult to play anything of any technical difficulty. We can, however, still have a lot of fun using the computer in this way.

Monophonic and polyphonic instruments

A monophonic instrument is one which can only play one ncte at a time.

Most instruments fall into this category, ie flute, trumpet, violin and although it is technically possible to play more than one note on some of them, they are generally classed as monophonic.

A polyphonic instrument is one which can sound many notes at once, and usually all of them if required, such as the piano, organ, harp etc.

You will often see synthesisers described as monophonic or polyphonic. Sometimes the polyphonic category is qualified by a number such as 6-note or 8-note polyphonic. Some monophonic synthesisers have a duophonic mode which means they can sound two notes at once. With the ever-decreasing cost of electronics and silicon chips, the trend is towards producing instruments with ever greater polyphonic capabilities.

The Amstrad as a monophonic instrument.

There is more than one way of writing a program which allows us to play music from the keyboard. The next program illustrates just one way in which it can be approached and it turns the computer into a monophonic keyboard.

```
100 REM Monophonic Keyboard
110 REM Prog 1
120 REM from F#-1 to D#1
130 :
140 ON BREAK GOSUB 270
150 SPEED KEY 255,255
160 keyboard$="1q2w3er5t6yu8i9o0p@^["+CHR$(16):REM Last note=CLR key
170 ENV 1,1,15,1,2,-1,2,13,-1,10
180 :
190 WHILE -1 200 play$=INKEY$:IF play$="" THEN 200
210 note=INSTR(keyboard$,play$)-6
220 freq=440*(2^(0+note-10)/12))
230 pitch=ROUND(125000/freq)
240 IF pitch<677 THEN SOUND 129,pitch,0,0,1
250 WEND
260:
270 SPEED KEY 20,3
280 STOP
```

Commentary

The program is so simple it could probably be condensed into a couple of lines. Line 150 slows down the repeat rate on the keys. Line 140 sees that they return to normal when you press ESC.

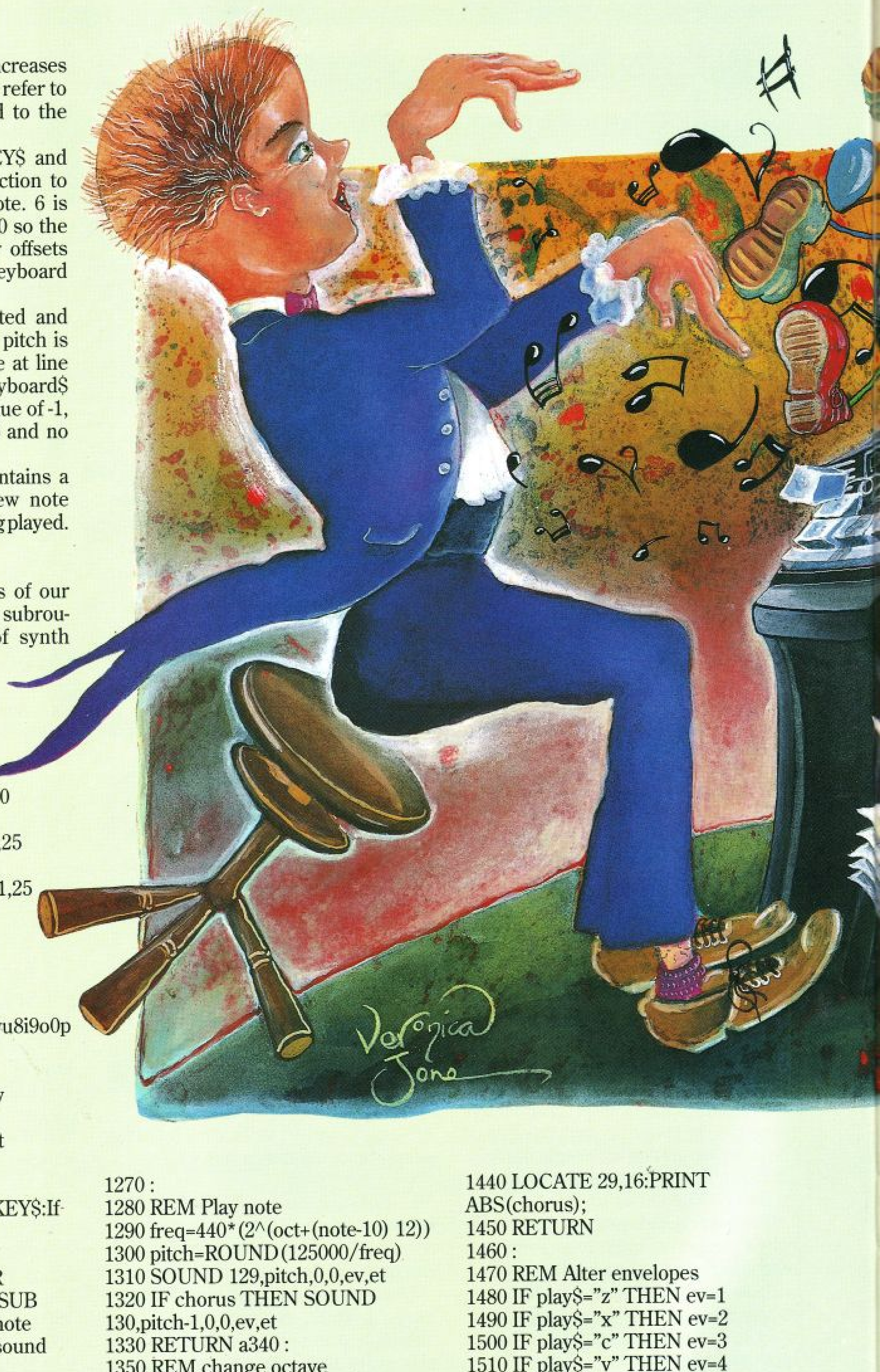
Keyboard$ contains the keys we use

and each key from left to right increases the pitch by a semitone. If you refer to the program they correspond to the notes from F#-1 to D#1.

Input is detected by INKEY$ and checked with the INSTR function to produce the note number, note. 6 is deducted from note in line 210 so the "1" key will play F#-1. Other offsets could be used to make the keyboard begin on another note.

From note, freq is calculated and then the pitch number. If the pitch is within range a sound is made at line 240. If a key not included in keyboard$ is pressed, note will have a value of -1, pitch will have a value of 716 and no sound will be made.

The SOUND command contains a flush instruction so each new note sounds immediately upon being played.



The Amstrad synthesiser

From the humble beginnings of our last program, we can add a few subroutines to produce a range of synth effects.

```
1000 REM PROGRAM 2
1010 REM Amstrad Synth
1020 REM From F#-1 to D#1
1030 :
1040 ON BREAL GOSUB 1900
1050 SPEED KEY 255,255
1060 ENV 1,1,15,1,2,-1,2,13,-1,25
1070 ENV 2,16,15,2
1080 ENV 3,15,1,1,4,-1,10,11,-1,25
1090 ENV 4,1,15,17,8,7,17,1,-
7,17,1,5,17,2,-2,17
1100 ENT -1,1,1,2,1,-2,2,1,1,2
1110 ENT -2,2,1,2,4,-1,2,2,1,2
1120 ENT 3,1,100,1,10,-10,1
1130 keyboard$=1q2w3er5t6yu8i9o0p
@^["+ CHR$(16)
1140 oct=0:ev=1:et=0
1150 GOSUB 1630:REM draw
keyboard
1160 GOSUB 1560:REM Print
Envelope Arrows
1170 :
1180 WILE -1 1190 play$=INKEY$:If
play$="" THEN
1190
1200 IF play$=CHR$(240) OR
play$=CHR$(241) THEN GOSUB
1360:GOTO 1190:REM Play note
1210 REM note-6 makes "1" sound
F#-1
1220 note=INSTR(keyboard$,play$)-6
1230 IF note>-6 THEN GOSUB
1290:GOTO1190:REM Play note
1240 IF play$=" " THEN GOSUB
1430:GOTO 1190:REM TAB key
toggles Chorus
1250 GOSUB 1480:REM Alter
envelopes
1260 WEND
1270 :
1280 REM Play note
1290 freq=440*(2^(oct+(note-10) 12))
1300 pitch=ROUND(125000/freq)
1310 SOUND 129,pitch,0,0,ev,et
1320 IF chorus THEN SOUND
130,pitch-1,0,0,ev,et
1330 RETURN a340 :
1350 REM change octave
1360 IF play$=CHR$(240) THEN
oct=oct+1 ELSE oct=oct-1
1370 IF oct<-2 THEN oct=3
1380 IF oct>3 THEN oct=-2
1390 LOCATE 38,16:PRINT oct;
1400 RETURN
1410 :
1420 REM chorus
1430 chorus=NOT chorus
1440 LOCATE 29,16:PRINT
ABS(chorus);
1450 RETURN
1460 :
1470 REM Alter envelopes
1480 IF play$="z" THEN ev=1
1490 IF play$="x" THEN ev=2
1500 IF play$="c" THEN ev=3
1510 IF play$="v" THEN ev=4
1520 IF play$="a" THEN et=0
1530 IF play$="s" THEN et=1
1540 IF play$="d" THEN et=2
1550 IF play$="f" THEN et=3
1560 LOCATE 1,21:PRINT SPC(19)
1570 LOCATE 4+5*et,21:Print
CHR$(240)
1580 LOCATE 1,22:PRINT SPC(19)
1590 LOCATE4+5*(ev-1),22:PRINT
```




```
CHR$(241)
1600 RETURN
1610 :
1620 REM Draw Keyboard
1630 MODE 1
1640 INK 0,13:INK1,0
1650 k1" " "+CHR$(143)+CHR$(143)
1660 k2$=k1$+k1$
1670 k3$=k2$+k1$+" "+CHR$(211)
1680k4$=" "+CHR$(211):FOR n=1 TO
13:k6$=k6$+k5$:NEXT
1700 PRINT:PRINT " 1 2 3 5 6 7 8 9 0
^"
1710 FOR n=1 TO 5:PRINT
k4$:NEXT
1720 FOR N=1 TO 6:PRINT
k6$:NEXT
1730 PRINT
CHR$(11)+CHR$(22)+CHR$(1);" ";
1740 FOR N=1 TO 36:PRINT
CHR$(210);:NEXT
1750 PRINT CHR$(11);CHR$(11);" Q
W E R T Y U I O P @ ]"
1760 PRINT CHR$(22)+CHR$(0)
1770 :
1780 PRINT:PRINT
TAB(35);CHR$(240)
1790 PRINT TAB(34);"oct:";oct;
1800 PRINT TAB(35); CHR$(241)
1810 :
1820 LOCATE 18,16:PRINT "TAB
chorus: 0"
1830 :
1840 LOCATE 1,19:PRINT " A S D F"
1850 PRINT " ENT0 ENT1 ENT2
ENT3"
1860 PRINT:PRINT:PRINT " Z X C
V"
1870 PRINT " ENV1 ENV2 ENV3
ENV4"
1880 RETURN
1890 :
1900 ON BREAK STOP
1910 SPEED KEY 20,3
1920 STOP
```

When run, the program draws a piano keyboard on the screen and shows the corresponding keys on the computer. The octave is altered with the up and down cursor keys, TAB toggles a chorus effect on and off, A, S, D and F select tone envelopes and Z, X, C and V select volume envelopes.

Commentary

The program begins by slowing down the repeat speed of the keys and defining the envelopes we are going to use. keyboard$ is the same as in the last program but now we can change octaves and envelopes so line 1140 sets default values.

Line 1150 calls the routine at 1630 which draws the keyboard. It is made up from six strings which are constructed in lines 1650 to 1690 and drawn in lines 1700 to 1760. The following lines print the other 'controls' on the screen. Transparency is turned on in line 1730 and off in line 1760 to allow the letters to be printed along the bottom of the keyboard.

The routine at line 1560 which is called by line 1160 is actually the end of the routine which handles the envelope selection. It is called to print the arrow pointers in the correct place.

The main loop lies between lines 1180 and 1260. Line 1190 waits for a key to be pressed. If it's a cursor key it calls the octave change routine. If it is a key in keyboard$, note will have a value greater than -6 and line 1230 will call the play note routine. If TAB has been pressed line 1240 calls the chorus routine. The other control keys alter the envelopes and these are checked for within the envelope alteration routine at line 1480 which is called if the program reaches line 1250.

The subroutines should need little explanation.

Lines 1290 to 1300 calculate frequency and pitch as usual. Line 1320 brings in a second voice, slightly out of tune, if chorus is on.

Lines 1360 to 1390 take care of octave changes. The octave will wrap around if you try to take it out of range.

The chorus routine switches the variable, chorus, between 0 (off) and -1 (on). We print 1 for on in line 1440 as opposed to -1 because it looks neater.

Lines 1480 to 1550 alter the envelopes. lines 1570 and 1590 calculate the position of the arrows which point to the selected envelopes.

Keyboard display

When playing a strange instrument it is often helpful to have a diagram of the keyboard with the relevant buttons or keys marked on. You may also find it useful to stick small pieces of paper over the keys you -don't- play to make the QWERTY layout look a little more like a piano keyboard.

Altering and developing the program

The effects are all quite short and most of the ideas and principles have been discussed in previous chapters.

The 'control' keys were chosen because most people are righthanded. They can be easily altered if desired.

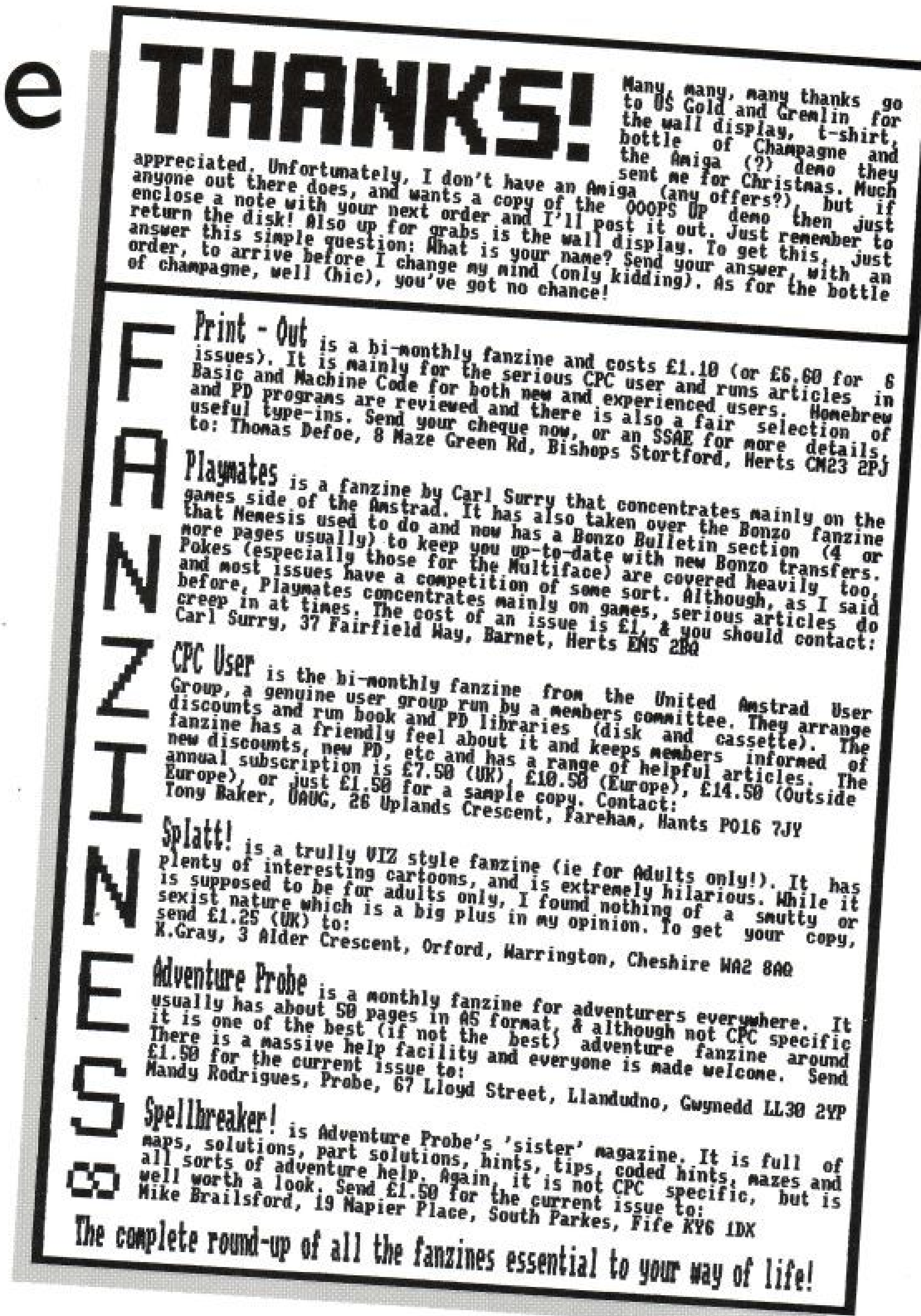
Add more effects. More envelopes can be added - even all 15 - and you could include the option to add noise, too. You could add a sub-octave switch. These can be found on many synthesisers and they sound a note an octave lower than the one you're playing to thicken the sound.

If you want to try some dazzling fingerwork, you may find the response a little slow. This tiny delay is not likely to be a problem but you can cut the response time by compressing the coding, using multi-statement lines and single letter integer variables.

Next month, we'll add a bass sequencer to this, and then take a look at two and three part tunes!!

PD Scene

Stop the press and read on as Paul Tint tells you how to power up your clip art on the cheap side.



THANKS!

Many, many, many thanks go
to US Gold and Gremlin for
the wall display, t-shirt,
bottle of Champagne and
the Amiga (?) demo they
sent me for Christmas. Much
appreciated. Unfortunately, I don't have an Amiga (any offers?), but if
anyone out there does, and wants a copy of the OOOPS UP demo then just
enclose a note with your next order and I'll post it out. Just remember to
return the disk! Also up for grabs is the wall display. To get this, just
answer this simple question: What is your name? Send your answer, with an
order, to arrive before I change my mind (only kidding). As for the bottle
of champagne, well (hic), you've got no chance!

FANZINES

Print - Out is a bi-monthly fanzine and costs £1.10 (or £6.60 for 6
issues). It is mainly for the serious CPC user and runs articles in
Basic and Machine Code for both new and experienced users. Homebrew
and PD programs are reviewed and there is also a fair selection of
useful type-ins. Send your cheque now, or an SSAE for more details,
to: Thomas Defoe, 8 Maze Green Rd, Bishops Stortford, Herts CM23 2PJ

Playmates is a fanzine by Carl Surry that concentrates mainly on the
games side of the Amstrad. It has also taken over the Bonzo fanzine
that Nemesis used to do and now has a Bonzo Bulletin section (4 or
more pages usually) to keep you up-to-date with new Bonzo transfers.
Pokes (especially those for the Multiface) are covered heavily too,
and most issues have a competition of some sort. Although, as I said
before, Playmates concentrates mainly on games, serious articles do
creep in at times. The cost of an issue is £1, & you should contact:
Carl Surry, 37 Fairfield Way, Barnet, Herts EN5 2BQ

CPC User is the bi-monthly fanzine from the United Amstrad User
Group, a genuine user group run by a members committee. They arrange
discounts and run book and PD libraries (disk and cassette). The
fanzine has a friendly feel about it and keeps members informed of
new discounts, new PD, etc and has a range of helpful articles. The
annual subscription is £7.50 (UK), £10.50 (Europe), £14.50 (Outside
Europe), or just £1.50 for a sample copy. Contact:
Tony Baker, UAUG, 26 Uplands Crescent, Fareham, Hants PO16 7JY

Splatt! is a trully VIZ style fanzine (ie for Adults only!). It has
plenty of interesting cartoons, and is extremely hilarious. While it
is supposed to be for adults only, I found nothing of a smutty or
sexist nature which is a big plus in my opinion. To get your copy,
send £1.25 (UK) to:
K.Gray, 3 Alder Crescent, Orford, Warrington, Cheshire WA2 8AQ

Adventure Probe is a monthly fanzine for adventurers everywhere. It
usually has about 50 pages in A5 format, & although not CPC specific
it is one of the best (if not the best) adventure fanzine around.
There is a massive help facility and everyone is made welcome. Send
£1.50 for the current issue to:
Mandy Rodrigues, Probe, 67 Lloyd Street, Llandudno, Gwynedd LL30 2YP

Spellbreaker! is Adventure Probe's 'sister' magazine. It is full of
maps, solutions, part solutions, hints, tips, coded hints, mazes and
all sorts of adventure help. Again, it is not CPC specific, but is
well worth a look. Send £1.50 for the current issue to:
Mike Brailsford, 19 Napier Place, South Parkes, Fife KY6 1DX

The complete round-up of all the fanzines essential to your way of life!

More Clip Art

After last months review of Stop-Press clip art, I received a letter from Alan Scully. It said "If your readers are looking for more clip art for Stop Press then they can get 6 pages and some fonts from James Garside, Taliesin, Rhodfa Anwyl, Rhuddlah, Glwyd LL18 2SF. Just send him 2 disks, £3 and an SSAE. Please note, though, that these pages are not public domain". So, there you have it, another 6 pages of clip—art to add to your collection.

Stop Presses Rival!

It had to happen. Someone had to do it. And, sure as eggs are eggs, they did. Pagemaker Plus is the public domain rival to Stop Press. Straight away, you can see one big advantage, the price. After all, Stop Press costs about 50 smackers and Pagemaker Plus only a quid. But, does the price reflect the quality?

Unlike Stop Press, Pagemaker Plus designs only A5 screens. This appears a disadvantage at first, but is not too much of a problem. With Stop Press, the text is not always as small as you'd like it, but with Pagemaker Plus, the text is large enough to read, and small enough to be able to produce a newsletter.

Pagemaker Plus is totally keyboard driven. When you start, you are presented with a blank screen, all except for a flashing cursor and a status bar. The flashing cursor is moved around the screen using the arrow keys, and the canvas is scrolled using shift or control and the arrow keys. The status window shows the size of text, the part of the canvas on display, and the char bar (more on this later).

An option menu can be selected by pressing TAB. This allows you to do various things such as load, save, print page, and change the height of the text.

Load and Save do the obvious things, however, each page, no matter how complex, takes up only 12K of disk space. This is a real boon since you can fit 28 pages on one disk, and just under 60 on an 800K disk!

Two print modes are available, draft and quality. Draft prints the page in about 10 minutes, and quality in about 20 minutes. However, quality print will only work if your printer can do reverse line feeds. To make sure your printer is compatible just type:-

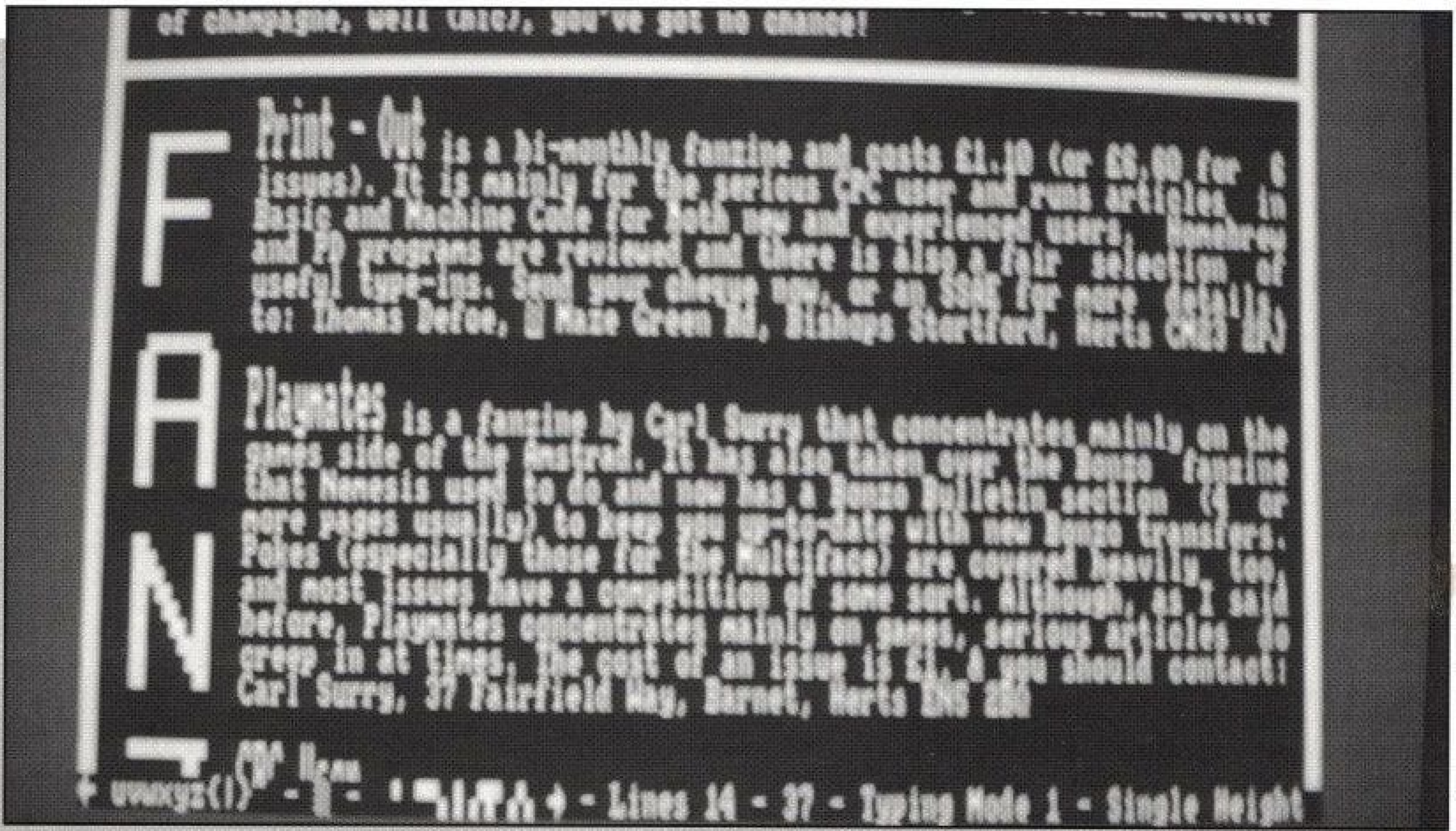
```
PRINT #8,"A"CHR$(27)CHR$(10)"A"
```

If your printer prints two A's, the second above the first, then you're OK. I used the program with my Star LC-10 and it worked fine.

The size of the text is one of the most limiting factors. Only two sizes are available, normal and double height. I'm told this is to stop on-screen printing becoming too slow, and to keep the pages as compact as possible for saving. However, it is nice to have bigger text for headlines, so there is a way around it.

As mentioned before, a 'char bar' resides in the status window. This allows you access to the ASCII/UDG characters 32 to 255. Using these, it is possible to make headlines, and although not as easy to do as Stop Press, it isn't too difficult.

The only other limiting factor is graphics, or rather, the lack of them. Because of the method used to store pages in memory, there is no graphics facility. However, normal 17K screens



can be printed to a third the size of a page, and these can be pasted (literally) onto the final print-out.

Unlike Stop Press, Pagemaker Plus is fully compatible with all CPC's, although no cassette version is available from it's original distributors, Scull PD. However, if you want it on cassette, you could try Data PD.

All things considered, Pagemaker Plus is good. The pages it produces are adequate for the most uses, and Scull PD uses the program to produce its newsletters.

Please note that the review of Pagemaker Plus was based on a prerelease copy. The final version should include extra features such as inverse text and character redefining, and should be available now.



Where to go

To get your grubby mits on some PD then contact any, or all, of the following libraries:

***Scull PD Library**, 119 Laurel Drive, East Kilbridge, Glasgow G75 9JG or phone Alan on 03555 24795. Send an SSAE for a copy of the concise stock list/newsletter which shows what can be done with Pagemaker Plus. To sample their wares, send £1, a disk, and SSAE.

* **Data PD Library**, 202 Park Street Lane, Park Street, St Albans, Herts AL2 2AQ. Send an SSAE or 30p to receive a copy of the Data Newsletter. Alternatively you can send a disk/cassette, 50p and SSAE to receive the 'Data PD Starter Pack' which contains a mixture of programs to get you started. Data supports both cassette and disk PD, and overseas orders are welcome (send £3.50 extra for disk and postage is to be supplied).

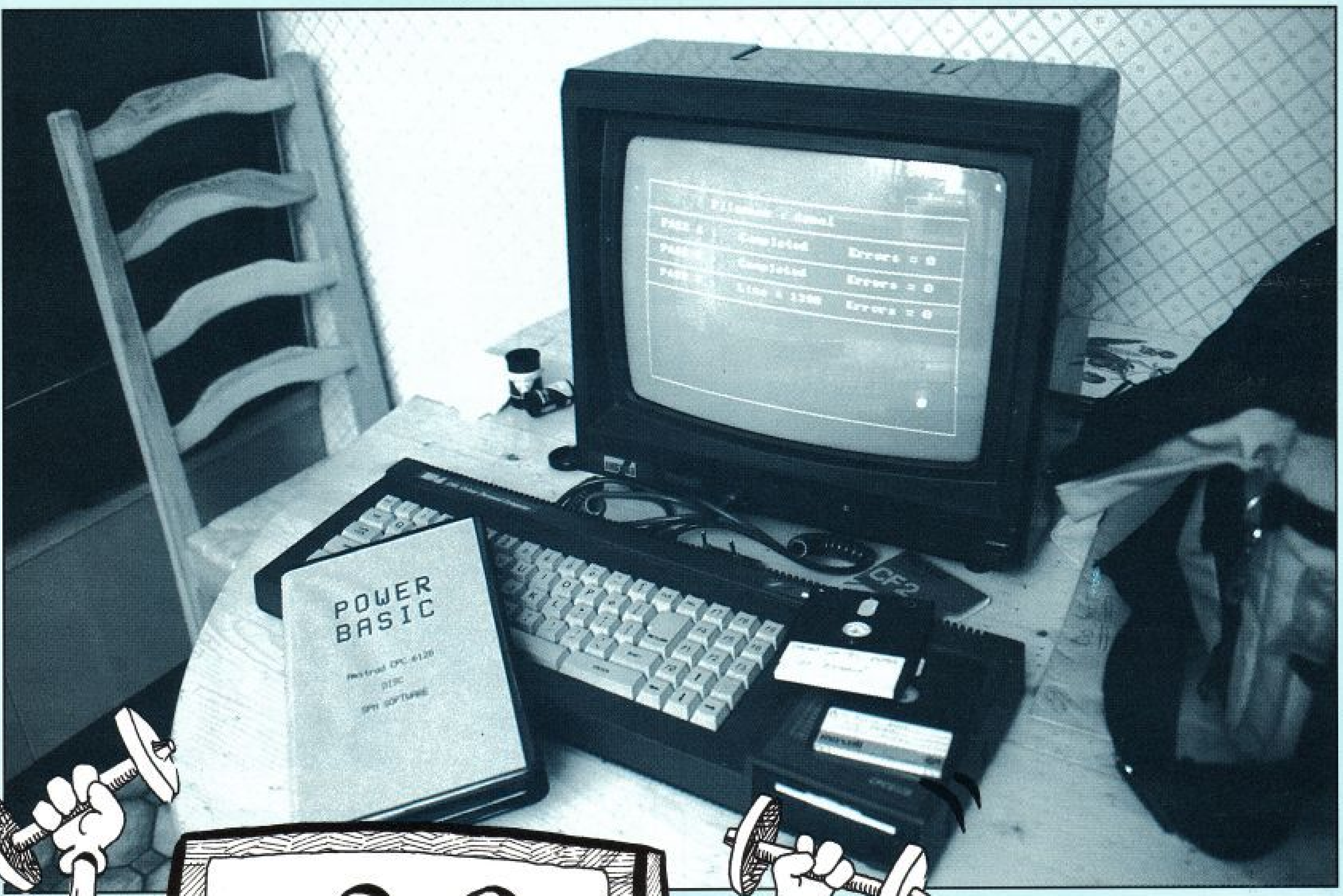
* **Adventure PD**, 10 Overton Road, Abbey Wood, London SE2 9SD or phone Debby on 081 310 9877. Send an SSAE for a copy of the catalogue. Prices are £1 per selection (one side of a disk), or £4.50 for two selections, including the disk.

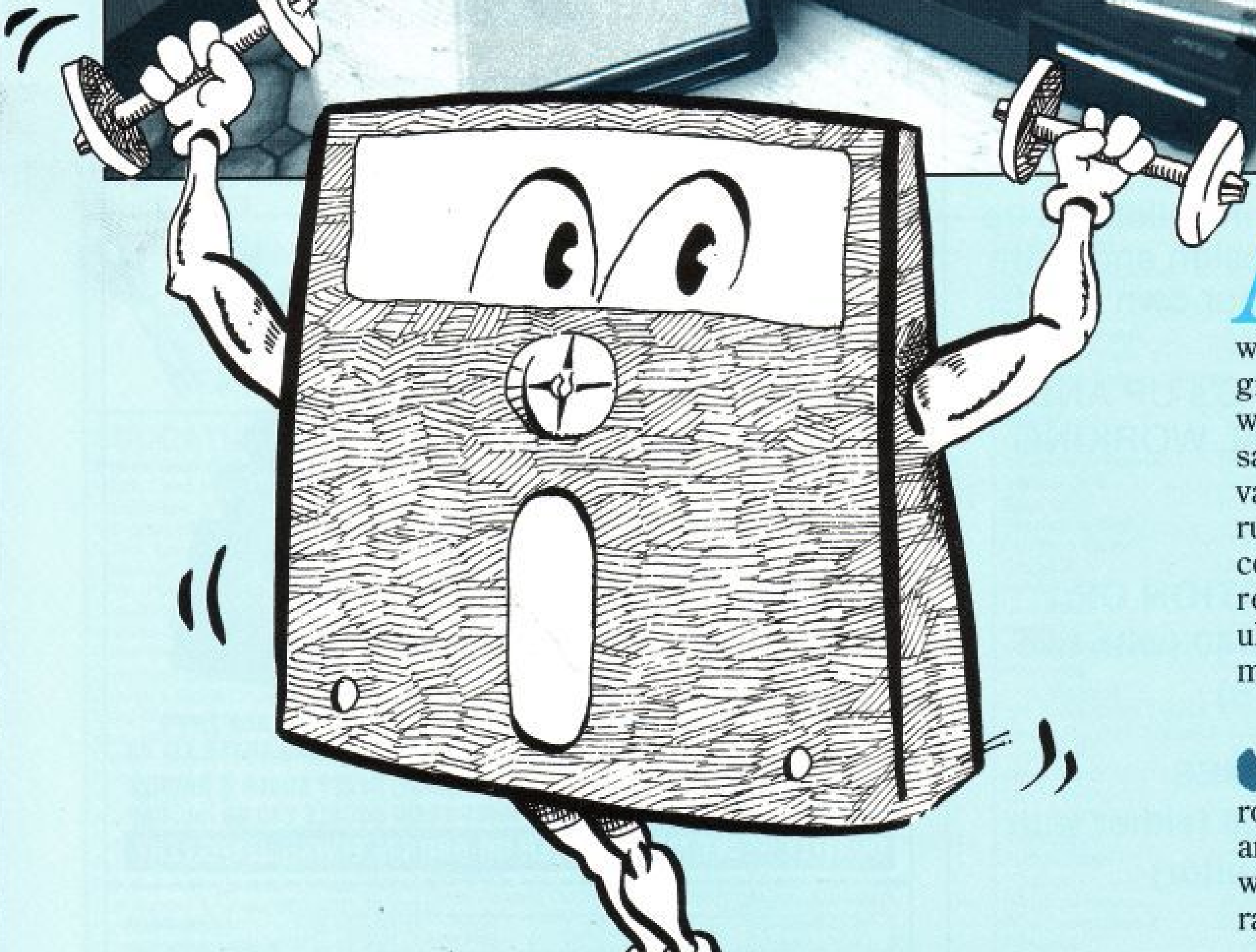
* **Demon PD**, 47 Hilton Avenue, Hall Green, Birmingham B28 0PE. A new library run by Chris Small and David Long. Their range includes mainly demo disks. For more details, send an SSAE.

Get in touch!

If you run a PD library and want some free publicity then why not send me some of your software? Just pop a disk or cassette (disks preferred), your stock list and all relevant details in a Jiffy Bag to The Public Domain Column c/o ACU. If you want your disks returned then include an SSAE.

You don't have to run a PD library to get in touch either. If you have some general comments about PD software, or have praise or complaints about a certain library, then just drop me a line.





Basic Power

Andrew Banner discovers how your BASIC programs can do 0-60 in under a day.

Are you forever writing routines which speed up the processing capabilities? Many years ago, when I was heavily involved in programming, I went various stages whereby I spent hours writing time saving, speed doubling routines on various computers. I had often tried running my programs through BASIC compilers but found that I had to reconstruct them using the regulations that were laid down in the manual. This required rearranging routines, not using certain commands and generally destroying hours of hard work. And after even more work, it rarely did.

Compiling BASIC programs into machine code is no new idea . I've still got BASIC compilers that date back to the early eighties. However, the most recent of compilers comes from a company based in County Durham and is interesting because it is not from one of the large software companies.

. Compiling is a process which turns a high level coded program, in this case BASIC and turns it into a low level, machine code, which runs at breakneck speeds, well when compared to the original anyway. BASIC is an interpreted, high level language. This means

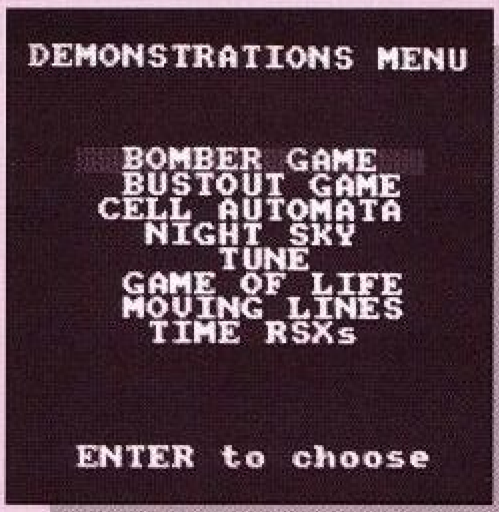
that it uses simple instructions in English which can be understood, more or less by anyone. Being interpreted means that the computer takes one command at a time and processes it. Once it has completed one command it looks at the program and takes the next, processes it and so it continues. This, as you can imagine, is slow as the processor is constantly searching it's associated memory for commands, processing them and then looking again. It's like keep opening the fridge door whilst making a sandwich. First you take out the bread and cut it, then you replace the bread and take out the butter and spread it, replace the butter and then get the ham and apply it. Put the ham back and reach for the mustard all the time opening and closing doors. It would be so much easier if you could have all the ingredients laid out on a table before you so you could simply reach for each unit as you required it.

That is what a compiler does. Before attempting to run the program, it takes the whole thing and processes it eventually churning out a piece of code which the process can immediately understand without the need for any secondary commands. It is, therefore much faster and more efficient in terms of processor effort. That's not to say that the CPU will ever become tired, but the more it has to do the slower it will become.

So that's compiling – a concept which is applied to many computer languages. BASIC was not designed to be compiled, it was written to be interpreted and as such compilers often can't cope with complex BASIC code, especially if the code is tatty and is not arranged in procedures. Pascal and Cobol are both compiled languages but each has a relatively slow turn around on errors as everything has to be compiled and then recompiled.

Power Basic is certainly powerful. It will adequately handle simple basic programs and has facilities to link RSXs in so that it can handle complex sprite movements. It is limited in it's original scope though as it is only available for the CPC6128 because it needs the extra RAM and a disc drive. However, the programs which it churns out will run on any CPC machine. The bank ram is used during the four pass compilation process to store many of the data tables and other information it needs. Using this extra memory allows programs of up to 35K to be compiled without problems.

I mentioned that the compiler operates on a four pass basis. The first calculates the amount of lines and allocates enough memory to accommodate the program. The second defines any procedures, dimensions any arrays and generally prepares the computer for what it is about to receive. The third pass is the one which does all the hard work of converting understandable English commands into seemingly incomprehensible computer gibberish, line by line, command by command. Because this is the section with the burden, it takes longer than any other







pass. The fourth pass finally generates any line references to jump to and finally saves the whole new machine code shebang to disc.

Turning the page in the manual gets you down to the nitty-gritty of the whole thing – getting it to work with your new masterpiece; Horace the Hooligan. Getting your Horace to work can be like trying to get to work yourself in the London rush hour -very difficult and extremely time consuming, especially if you didn't plan your journey properly. If you wrote Horace before ever using Power Basic then you could be in for a long time debugging and restructuring.

Power Basic, like most compilers, will restrict the use of certain commands and any mathematical expressions have to have special care applied especially when using floating point maths. Here you must avoid using floating point routines as Power Basic simply won't support them. Some of the other restrictions are obvious and easy to adhere to, such as the use of line numbers; only those in the range of 1 to 32767 can be used and all variables must be explicitly defined without using the DEFINT and DEFSTR commands.

One of the main drawbacks of BASIC compilers is the limited usage of certain keywords such as DIM. However, after a bit of practice you soon become used to these restrictions and learn to work around them. However, there are still a good few keywords which are not supported by Power Basic, such as ZONE, WAIT and CLEAR.

The software itself, I am sorry to say, is bugged. After running some of he fantastic demos on the disc, I decided to look at the compiler and so ran it. The software first asks for a file name. At this point, your mind turns to jelly and you hunt around in the wobbliness for the name which you gave to your program. No such luck so you cautiously type "CAT" for a disc directory and the software begins to look for a file called CAT. So it doesn't find it and immediately goes into a sulk of mega proportions as your CPC locks up. The same happens if you completely omit a filename.

Running your program after it has been successfully compiled can be achieved from either a tape or disc. If you wish to store your software on tape the TAPEDUMP.BAS file will handle the transfer for you. Once compilation is complete and you have saved it to whichever media you choose, you can run the software without the aid of Power Basic, your new machine code program is now self sufficient.

Of course, this makes it sound very easy, but you must ensure that you are about to compile a completely bug free piece of code else you could be wasting a lot of time.

Power Basic certainly works very well and does speed up BASIC programs by up to 20 times but care has now been taken into the design of the software's front end and the few bugs that crept in making the software annoying to use in the beginning have since been ironed out to provide trouble-free coding.

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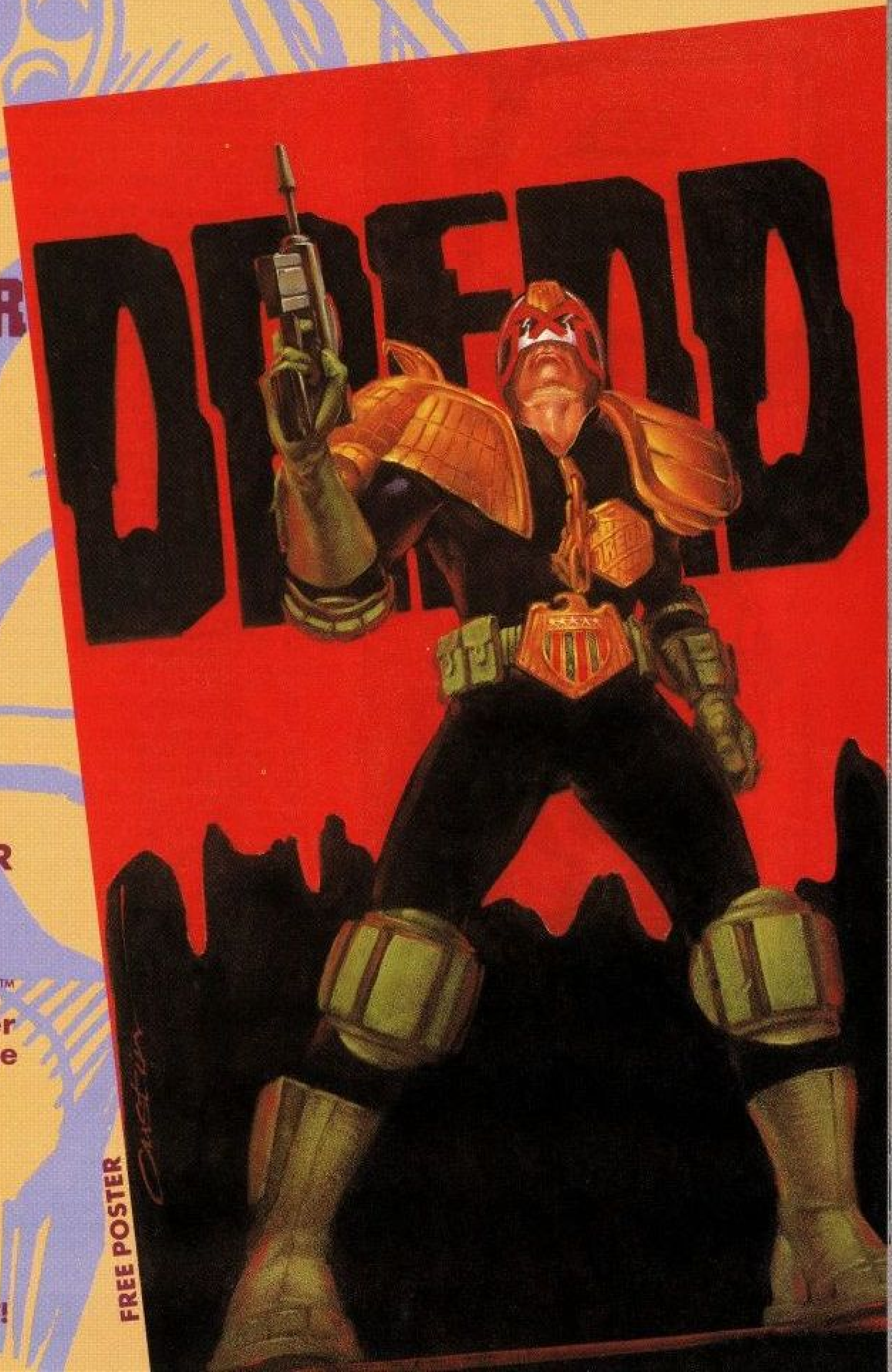
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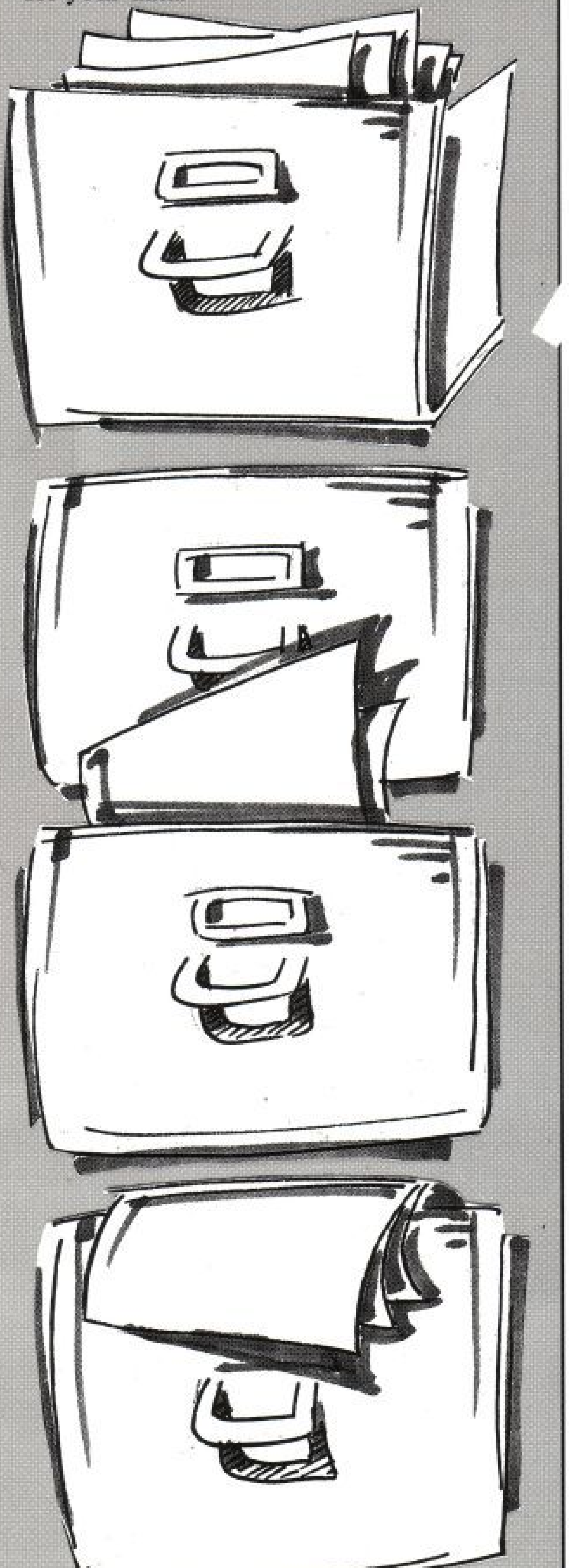
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DATABASE

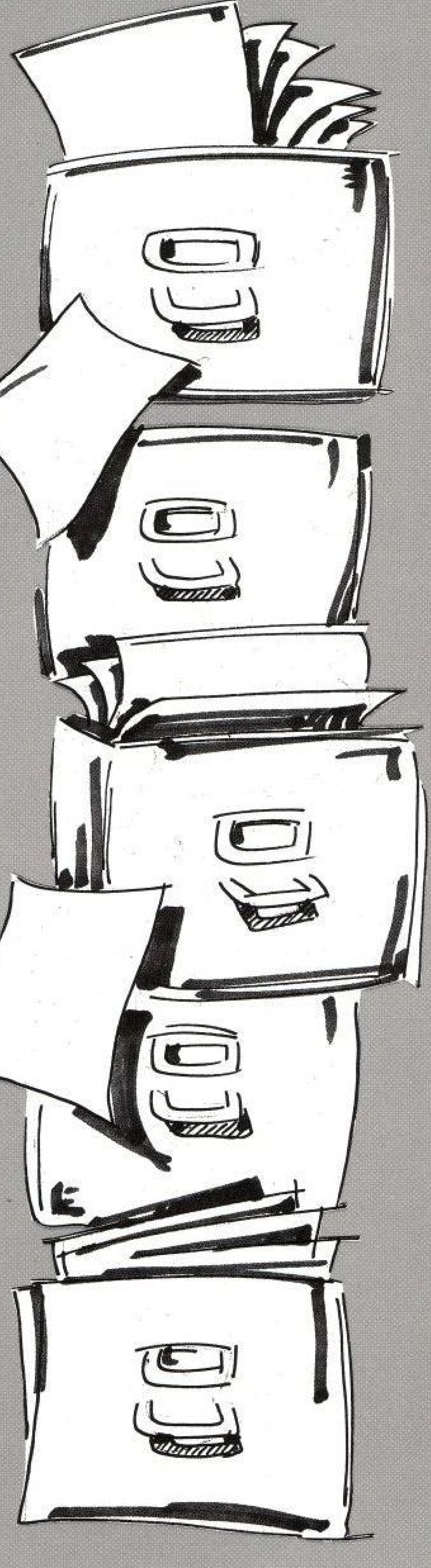
BY ALAN KENNEDY

Here's a marvellous all-purpose work-horse for your delectation. Run it and take a look through the extensive menu for information about the system itself, then use it for whatever you want. Enter your own records, to a total of 400 and you should find this a very handy source for your data.

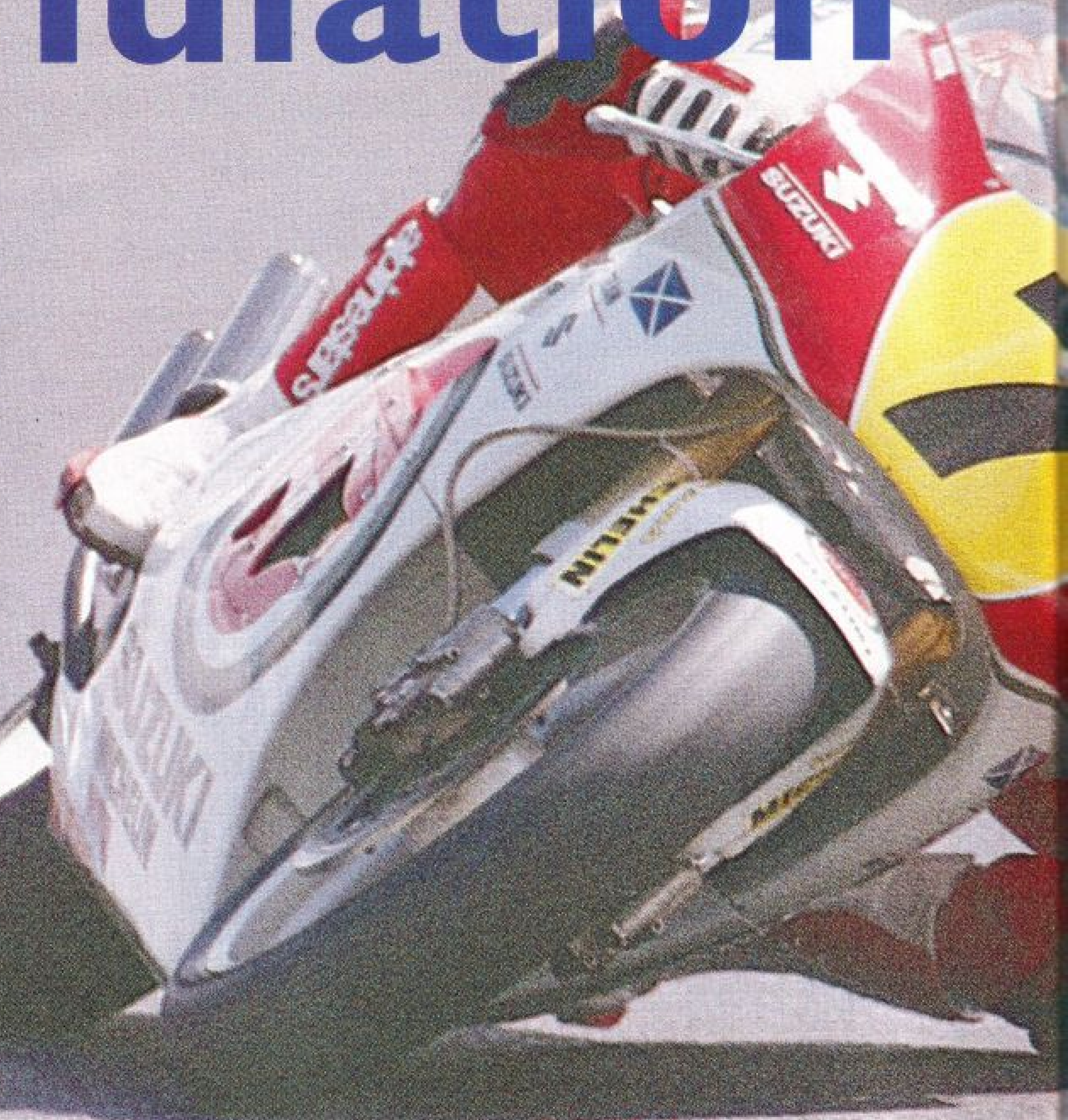


```
5 REM DATABASE BY ALAN KENNEDY 1990 [6A]
10 '  Initialisation [F1]
20 ' [F2]
30 DIM f$(16),a$(16),m(16),N(16),s$(200,16):KEY 139,CHR$(6)+
CHR$(13):MODE 2:BORDER 2:INK 1,0:INK 0,14 [FE]
40 ' [F4]
50 '  Main Program [F5]
60 ' [F6]
70 h$="MASTER MENU":GOSUB 1740:MOVE 160,32:DRAW 160,352:DRAW
 448,352:DRAW 448,32:DRAW 160,32:MOVE 160,304:DRAW 448,304:M
OVE 175,31:DRAW 449,31:DRAW 449,335:MOVE 175,29:DRAW 450,29:
DRAW 450,335:MOVE 451,29:DRAW 451,335:MOVE 452,29:DRAW 452,3
35:LOCATE 35,5 [6F]
80 PRINT"OPTIONS":LOCATE 25,8:PRINT"A. Create New File":LOCA
TE 25,9:PRINT"B. Enter Data":LOCATE 25,10:PRINT"C. Alter Dat
a/Delete Record":LOCATE 25,11:PRINT"D. Alter Field Names":LO
CATE 25,12:PRINT"E. Search File":LOCATE 25,13:PRINT"F. Save
File" [99]
90 LOCATE 25,14:PRINT"G. Load File":LOCATE 25,15:PRINT"H. In
formation":LOCATE 25,16:PRINT"I. Browse Files":LOCATE 25,17:
PRINT"J. Sort Records":LOCATE 25,18:PRINT"K. Print Records":
LOCATE 25,19:PRINT"L. Tabulate Records":LOCATE 25,20:PRINT"M
. End Program" [48]
100 LOCATE 29,22:PRINT"Enter Choice (A - M)"; [5C]
110 in$=UPPER$(INKEY$):IF in$=""THEN 110 [1B]
120 in=ASC(in$)-64:IF in<1 OR in>13 THEN 110 [68]
130 ON in GOSUB 170,370,490,690,810,1370,1460,1620,1810,1930
,2010,2100,2410:GOTO 70 [84]
140 ' [A9]
150 '  Create New File [AB]
160 ' [AD]
170 h$="CREATE NEW FILE":GOSUB 1740:IF nf=0 THEN 250 [11]
180 LOCATE 16,12:PRINT"Are you sure you want to create a new
 file (Y/N)"; [B2]
190 in$=UPPER$(INKEY$):IF in$=""THEN 190 [63]
200 IF in$="N"THEN RETURN ELSE IF in$<>"Y"THEN 190 [9B]
210 GOSUB 1750:LOCATE 19,12:PRINT"Do you wish to save the cu
rrent file (Y/N)" [51]
220 in$=UPPER$(INKEY$):IF in$=""THEN 220 [6B]
230 IF in$="N"THEN 250 ELSE IF in$<>"Y"THEN 220 [1A]
240 GOSUB 1370:RETURN [70]
250 tr=0:GOSUB 1750:LOCATE 28,12:INPUT"How many fields (1-16
): ",nf:IF nf<1 OR nf>16 OR nf<>INT(nf)THEN LOCATE 51,12:GOT
O 250 [9B]
260 LOCATE 20,15:INPUT"Maximum field length (1-62 Characters
): ",f1:IF f1<1 OR f1>62 OR f1<>INT(f1)THEN LOCATE 60,15:GOT
O 260 [74]
270 GOSUB 1740:j=f1:f1=18:F=0:GOSUB 1580:GOSUB 1770:LOCATE 1
5,23:PRINT"Enter a name for each field - e.g. Name, Address,
 etc.":FOR i=1 TO nf [1F]
280 LOCATE tl,ru+i:PRINT"Field ";:IF i>9 THEN PRINT CHR$(8); [3C]
290 PRINT i;": ";STRING$(10,216):LOCATE tl+11,ru+i:LINE INPU
T"",N$:LOCATE tl+11,ru+i:PRINT N$;SPC(10-LEN(N$)):WHILE LEN(
N$)>0:IF ASC(N$)=32 THEN N$=RIGHT$(N$,LEN(N$)-1):WEND [D4]
300 IF N$=""THEN 280 [A3]
310 IF LEN(N$)>10 THEN N$=LEFT$(N$,10) [58]
320 IF N$=SPACE$(LEN(N$))THEN 280 [69]
330 f$(i)=N$:NEXT:f1=j:GOSUB 1560:RETURN [41]
340 ' [AB]
350 '  Enter Data [AD]
360 ' [AF]
370 IF nf=0 THEN RETURN [53]
380 h$="ENTER DATA":GOSUB 1740:IF tr<400 THEN 440 [2A]
390 LOCATE 29,10:PRINT"NO ROOM FOR MORE DATA":LOCATE 19,12:P
RINT"Do you want to delete any records (Y/N) " [94]
400 in$=UPPER$(INKEY$):IF in$=""THEN 400 [67]
410 IF in$="Y"THEN GOSUB 490:RETURN [AD]
420 IF in$<>"N"THEN 400 [5F]
430 RETURN [C4]
440 tr=tr+1:LOCATE 1,1:PRINT CHR$(24);" Record number";tr;CH
R$(24):GOSUB 1770:FOR i=1 TO nf:LOCATE tl+(F-LEN(f$(i))),ru+
i:PRINT f$(i);" : ";:PRINT STRING$(f1,216);:LOCATE tl+F+3,ru
+i:LINE INPUT"",F0$:IF LEN(F0$)>f1 THEN GOSUB 1760 [16]
450 LOCATE tl+F+3,ru+i:PRINT F0$;SPC(f1-LEN(F0$)):s$(tr,i)=F
0$:NEXT:RETURN [AA]
460 ' [B0]
470 '  Alter Data [B2]
480 ' [B4]
490 IF tr=0 THEN RETURN [F4]
500 h$="ALTER DATA / DELETE RECORD":GOSUB 1740 [AC]
510 LOCATE 16,12:PRINT"Enter number of record to be altered
( 1 -";tr;"):";TAB(65); [F5]
520 LINE INPUT"",rn$:IF rn$=""THEN 510 ELSE rn=VAL(rn$) [8E]
530 IF rn<1 OR rn>tr OR rn<>INT(rn)THEN LOCATE 65,12:GOTO 52
0 [1E]
540 GOSUB 1740:LOCATE 1,1:PRINT CHR$(24);" Record Number";rn
;CHR$(24):GOSUB 1770:FOR j=1 TO nf:LOCATE tl+(F-LEN(f$(j))),
ru+j:PRINT f$(j);" : ";s$(rn,j):NEXT:LOCATE 18,23:PRINT"Pres
s A to alter, D to delete or <ANY> for menu" [88]
550 in$=UPPER$(INKEY$):IF in$=""THEN 550 [5B]
560 IF in$="A"THEN 600 [D5]
570 IF in$<>"D"THEN RETURN [44]
580 LOCATE 34,25:PRINT"Deleting Now":IF rn=tr THEN tr=tr-1:R
ETURN [F4]
```

```
590 FOR i=rn+1 TO tr:FOR j=1 TO nf:s$(i-1,j)=s$(i,j):NEXT j,
i:tr=tr-1:RETURN [B3]
600 nf=nf+1:GOSUB 1580:nf=nf-1:GOSUB 1740:LOCATE 1,1:PRINT C
HR$(24)" Record Number";rn;CHR$(24):LOCATE 8,24:PRINT"Enter
new data for each field or hit <ENTER> to leave unchanged":G
OSUB 1770:FOR i=1 TO nf:LOCATE tl+(F-LEN(f$(i))),ru+i [E4]
610 PRINT f$(i);" : ";s$(rn,i):LOCATE tl+F+3,ru+i+1:PRINT ST
RING$(f1,216):LOCATE tl+F+3,ru+i+1:LINE INPUT"",F0$:LOCATE t
l+F+3,ru+i+1:PRINT SPC(f1):IF LEN(F0$)>f1 THEN GOSUB 1760 [D7]
620 LOCATE tl+F+3,ru+i:PRINT F0$;:PRINT SPC(f1-LEN(F0$)):IF
LEN(F0$)>f1 THEN F0$=LEFT$(F0$,f1) [9B]
630 IF LEN(F0$)>0 THEN IF ASC(F0$)=6 THEN 650 [05]
640 s$(rn,i)=F0$ [4F]
650 LOCATE tl+F+3,ru+i:PRINT s$(rn,i);SPC(f1-LEN(s$(rn,i))):
NEXT:GOSUB 1560:RETURN [E3]
660 ' [B2]
670 '  Alter Field Names [B4]
680 ' [B6]
690 IF nf=0 THEN RETURN [5A]
700 h$="ALTER FIELD NAMES":GOSUB 1740:x=f1:f1=10:GOSUB 1560:
GOSUB 1770:LOCATE 8,23:PRINT"Enter new name for each field o
r hit <ENTER> to leave unchanged":FOR i=1 TO nf:LOCATE tl+(F
-LEN(f$(i))),ru+i:PRINT f$(i);" : "; [64]
710 LOCATE tl+F+3,ru+i:LINE INPUT"",N$:IF N$=""THEN 710 [E9]
720 WHILE LEN(N$)>0:IF ASC(N$)=32 THEN N$=RIGHT$(N$,LEN(N$)-
1):WEND [3F]
730 IF N$=""THEN 710 [82]
740 IF LEN(N$)>10 THEN N$=LEFT$(N$,10) [62]
750 IF LEN(N$)>0 THEN IF ASC(N$)=6 THEN 770 [35]
760 f$(i)=N$ [C6]
770 LOCATE tl+F+3,ru+i:PRINT f$(i):NEXT:f1=x:GOSUB 1560:RETU
RN [9A]
780 ' [B7]
790 '  Search File [B9]
800 ' [A8]
810 IF tr=0 THEN RETURN [E8]
820 h$="SEARCH FILE":GOSUB 1740:IF tr=1 THEN 990 [0F]
830 LOCATE 2,23:PRINT"Enter search parameters for each field
, or press ENTER alone if no parameters.":GOSUB 1770:FOR i=1
 TO nf [F4]
840 LOCATE tl+F-LEN(f$(i)),ru+i:PRINT f$(i);" : ";:LINE INPU
T"",F0$:IF F0$=""THEN 980 [64]
850 IF ASC(F0$)=6 THEN LOCATE tl+F+3,ru+i:PRINT" ":F0$="":GO
TO 980 [BA]
860 T0$=F0$:N(i)=0:l$=LEFT$(F0$,1):IF l$="\"THEN IF LEN(F0$)
<3 THEN 840 ELSE N(i)=-1:F0$=RIGHT$(F0$,LEN(F0$)-1):l$=LEFT$
(F0$,1) [7C]
870 r$=RIGHT$(F0$,1):IF r$="*"THEN F0$=LEFT$(F0$,LEN(F0$)-1) [BE]
880 IF l$="*"AND r$="*"THEN m(i)=6:GOTO 950 [85]
890 IF l$="*"THEN m(i)=8:GOTO 950 [6B]
900 IF r$="*"THEN m(i)=7:GOTO 950 [72]
910 IF l$="="THEN m(i)=1:GOTO 950 [98]
920 IF l$="<"THEN IF MID$(F0$,2,1)="="THEN m(i)=4:F0$=RIGHT$
(F0$,LEN(F0$)-1):GOTO 950 ELSE m(i)=2:GOTO 950 [3F]
930 IF l$=">"THEN IF MID$(F0$,2,1)="="THEN m(i)=5:F0$=RIGHT$
(F0$,LEN(F0$)-1):GOTO 950 ELSE m(i)=3:GOTO 950 [EB]
940 m(i)=1:F0$="="+F0$ [DB]
950 IF LEN(F0$)<2 THEN 840 [CB]
960 IF LEN(F0$)>f1+1 THEN F0$=LEFT$(F0$,f1+1) [4F]
970 LOCATE tl+F+3,ru+i:PRINT T0$:F0$=RIGHT$(F0$,LEN(F0$)-1) [6A]
980 a$(i)=UPPER$(F0$):NEXT:LOCATE 1,23:PRINT CHR$(18);TAB(33
);"Searching Now" [55]
990 F4=0:FOR i=1 TO tr:LOCATE 1,1:PRINT CHR$(24);" Record Nu
mber ";i;CHR$(24):IF tr=1 THEN 1230 [03]
1000 M0=0:FOR j=1 TO nf:IF a$(j)=""THEN 1210 [72]
1010 IF m(j)=1 AND((N(j)=0 AND UPPER$(s$(i,j))=a$(j))OR(N(j)
=-1 AND UPPER$(s$(i,j))<>a$(j)))THEN 1210 [D8]
1020 IF m(j)=2 AND((N(j)=0 AND UPPER$(s$(i,j))<a$(j))OR(N(j)
=-1 AND UPPER$(s$(i,j))>=a$(j)))THEN 1210 [0D]
1030 IF m(j)=3 AND((N(j)=0 AND UPPER$(s$(i,j))>a$(j))OR(N(j)
=-1 AND UPPER$(s$(i,j))<=a$(j)))THEN 1210 [D4]
1040 IF m(j)=4 AND((N(j)=0 AND UPPER$(s$(i,j))<=a$(j))OR(N(j
)=-1 AND UPPER$(s$(i,j))>a$(j)))THEN 1210 [CD]
1050 IF m(j)=5 AND((N(j)=0 AND UPPER$(s$(i,j))>=a$(j))OR(N(j
)=-1 AND UPPER$(s$(i,j))<a$(j)))THEN 1210 [92]
1060 IF m(j)=6 AND((N(j)=0 AND INSTR(UPPER$(s$(i,j)),a$(j))>
0)OR(N(j)=-1 AND INSTR(UPPER$(s$(i,j)),a$(j))=0))THEN 1210 [E0]
1070 IF m(j)<>7 THEN 1140 [86]
1080 IF N(j)=-1 THEN 1120 [27]
1090 IF m(j)=7 THEN IF LEN(s$(i,j))>=LEN(a$(j))THEN IF LEFT$
(UPPER$(s$(i,j)),LEN(a$(j)))=a$(j)THEN 1210 [DE]
1100 IF LEN(s$(i,j))>=LEN(a$(j))THEN IF LEFT$(UPPER$(s$(i,j)
),LEN(a$(j)))=a$(j)THEN 1210 [D2]
1110 GOTO 1220 [3D]
1120 IF LEN(s$(i,j))<LEN(a$(j))THEN 1210 [37]
1130 IF LEFT$(UPPER$(s$(i,j)),LEN(a$(j)))<>a$(j)THEN 1210 [91]
1140 IF m(j)<>8 THEN 1220 [75]
1150 IF N(j)=-1 THEN 1180 [B0]
1160 IF LEN(s$(i,j))>=LEN(a$(j))THEN IF RIGHT$(UPPER$(s$(i,j
)),LEN(a$(j)))=a$(j)THEN 1210 [2A]
1170 GOTO 1220 [4F]
1180 IF LEN(s$(i,j))<LEN(a$(j))THEN 1210 [49]
1190 IF RIGHT$(UPPER$(s$(i,j)),LEN(a$(j)))<>a$(j)THEN 1210 [C6]
1200 GOTO 1220 [3C]
1210 M0=M0+1 [C8]
1220 NEXT j:IF M0<nf THEN 1300 [74]
1230 F4=-1:GOSUB 1740:LOCATE 1,1:PRINT CHR$(24);" Record num
ber ";i;CHR$(24):GOSUB 1770:FOR j=1 TO nf:LOCATE tl+F-LEN(f$
(j)),ru+j:PRINT f$(j);" : ";s$(i,j):NEXT j [83]
1240 LOCATE 9,23:PRINT"Press S to continue, C to Change, P t
o print or <ANY> for Menu" [12]
1250 in$=UPPER$(INKEY$):IF in$=""THEN 1250 [44]
```



Simulation Stimulation



You roll back gently on the grip, slowing the big *Yamaha FZR-1000* down from 150 to a more controllable 120 mph. The curve ahead is approaching fast – too fast. You kick down into fourth gear. The transmission whines as it strains to retard over 650 lbs of bike and rider. The bend has not fully unfolded yet and a quick squeeze on the brakes allow you to momentarily hold the bike steady at 100 mph. You can now see something of the curve's radius and experience tells you that most sweeping bends, like this one, can be taken at between 80 and 110 mph. Almost at the hard-braking point, you ease the *FZR* to the extreme edge of the road. You've made your decision and it had better be correct. A mistake at this speed could be catastrophic.

Keeping the bike as perpendicular as possible you hit the brakes hard. Fibre pads bite into three huge, steel discs and in less than a second, speed drops to 80 mph. During that moment of hard-braking you have also changed into third. This is your fail-safe. The lower gear will give you more control; a better distribution of power and instant response; more feel as the rear tyre scrabbles for grip on the smooth tarmacadam, and the priceless ability to make minute changes to line and lean.

This is it. You shift your weight and throw the bike into the curve. Now you can see the exit of the bend and the straight road beyond. With the tacho needle nudging 8,000 the bike powers across the apex. The toe of your right boot scrapes the road and the angle of lean gives you a forty-five degrees view of white lines edging closer to the front wheel. Slowly the bike straightens as you once more shift body weight. The needle of the tacho nears the red line at eleven-and-a-half. You knock the gear lever back into forth, and with the bike upright, feed in more power. Within two seconds you're in fifth gear and the bike is back up to 120 mph, still accelerating. And the next bend is approaching fast.

Simulations. Are they up to scratch? Vic Barnes shows you just how close you can come to the real thing.

End of daydream.

But it *is* no daydream. Riding and testing a modern superbike *is* like that. Granted, it takes an experienced rider to tackle a bend in the fashion described above, but that's how it is done if you are on 'unrestricted' roads, or track. So why can't computer race 'simulators' capture even a tiny slice of that technique, or thrill?

I've tried most (but not all) motorcycle and car race games, as well as a few oddballs, and 95% were rubbish! There have only been two games which contained any of the elements of *real*, speed driving and control. Unfortunately, neither were motorcycle games.

If you haven't already bought them,

I can definitely recommend *Bobsleigh* and *Stunt Car Racer*.

The people at *Digital Integration* got *Bobsleigh* right because they called in top driver Nick Phipps and brakeman Alan Cearnes. This is a genuine simulation in which the bobsleigh actually handles, and can be manoeuvred accurately – just like the real thing. For example, when your bob brushes against the ice wall you can almost *feel* it; hit the wall though and the screen shudders! Speed of the bob is carefully programmed to match reality. Ride the infamous Cresta Run at St Moritz, in an Olympic-class bob, and your times are close to the record for that course. In fact, all the things you do on a bobsleigh are duplicated on the CPC. Joystick control is near perfection.

Stunt Car Racer is as good as *Bobsleigh* for different reasons. Its most realistic feature is the amount of control the program (and the joystick) gives you. Approach one of the banked curves at 240 mph, change down and 'shut-off' and you get the impression of a car under engine braking. If your line is right when you enter the bend, it is necessary to feed in power to maintain speed and exit correctly. Too quick into the corner and centrifugal force will take you, 'over the edge!' In fact, this is one program that confirms the racing maxim, 'slow in and quick out!'

There are other small points which make both programs exceptions rather than the rule. What they have in common is vector-style, 3D 'track' backgrounds. In fact, the graphics aren't all that good. Obviously, programmers of both games decided to use most of the available memory to ensure excellent control and supreme 'playability'.

Cycles and *Hard Drivin'* were a couple of programs that almost got it right, but suffered from dreadful joystick control. The latter was especially bad, because it needed about a second for the program to respond to any movement of the joystick. The response time on *Cycles* was a lot less, but still far too great. I did quite enjoy playing it, although the 500cc Yamaha felt more like a horizontal pogo-stick. On the credit side, the representation of the various Grands Prix circuits was particularly accurate.

Right now, there are probably software companies planning to jump on the high-speed gravy train. With another race-bike simulation. Before you go any further fellas, hold it.

Call in the experts. Contact one of the bike magazines and get their advice. Better still, I'm sure Ron Haslam, Kevin Schwantz, or Niall McKenzie would be delighted to help and even endorse a good, finished product. Above all, you need a *rider* to tell you what driving one of today's high performance machines is *really* like. (Did you know the average superbike can leave a *Lambourghini Countache* for dead, accelerating from 0-60 mph in about 2 seconds?)

The joystick controls and features of a motorcycle (or car) simulation seem obvious. Push the stick forward to accelerate; pull back to brake; centre to maintain speed; left, or right to crank the bike and press fire to change gear. (There is no such thing as 'automatic transmission' on a bike.) But some of the methods I've tried were…weird!

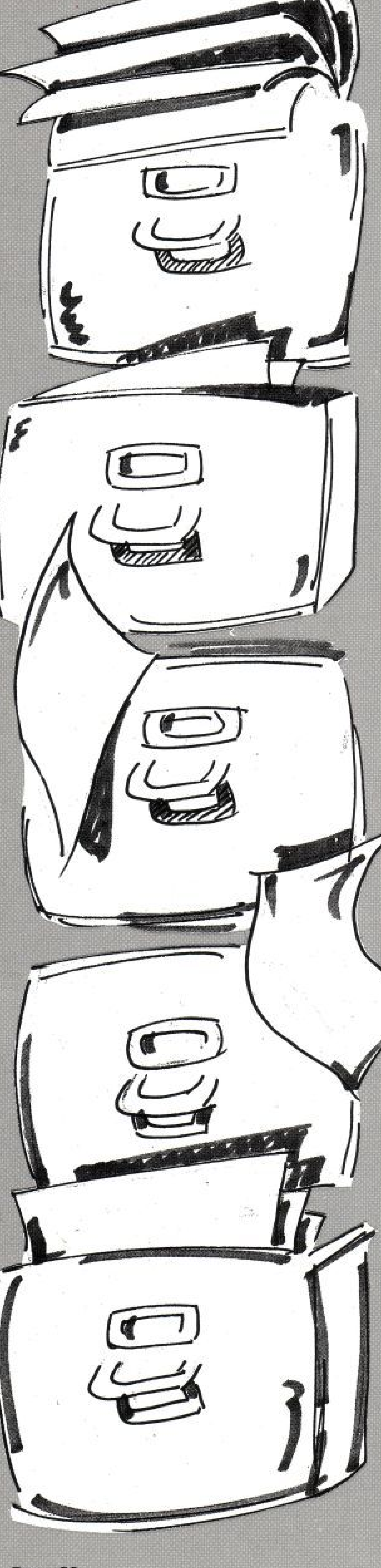
Angle of lean could be tied to road-speed and engine revs. Too much lean at the wrong speed and you slide gracefully off the track; too much acceleration while banked over and the 'back end' breaks away, with the same result. Put yourself in too high a gear for a corner and you have less control; too low a gear and you have more control, but less speed. Just like the real thing, it's a matter of making the right decisions and getting the balance right.

Finally, one of the anomalies of *reality* versus *simulation*, is that in reality you have more time and space! Oddly enough, this doesn't make things easier, but require the use of judgement, technique, skill and timing as well as reactions.

On a race track there is only *one* correct line, though there are *many* alternatives, with subtle differences. Getting 'the line' right is one of the arts of racing. Simulator race tracks are much too narrow and the bends far too tight. In fact there is no such thing as a 'line'. The whole game becomes a frantic, joystick-waggling blur. If programs were slowed-down and scaled-up, more technique built-in and more features incorporated, such as marker boards and flags etc, race games could be truly classed as *simulators*.

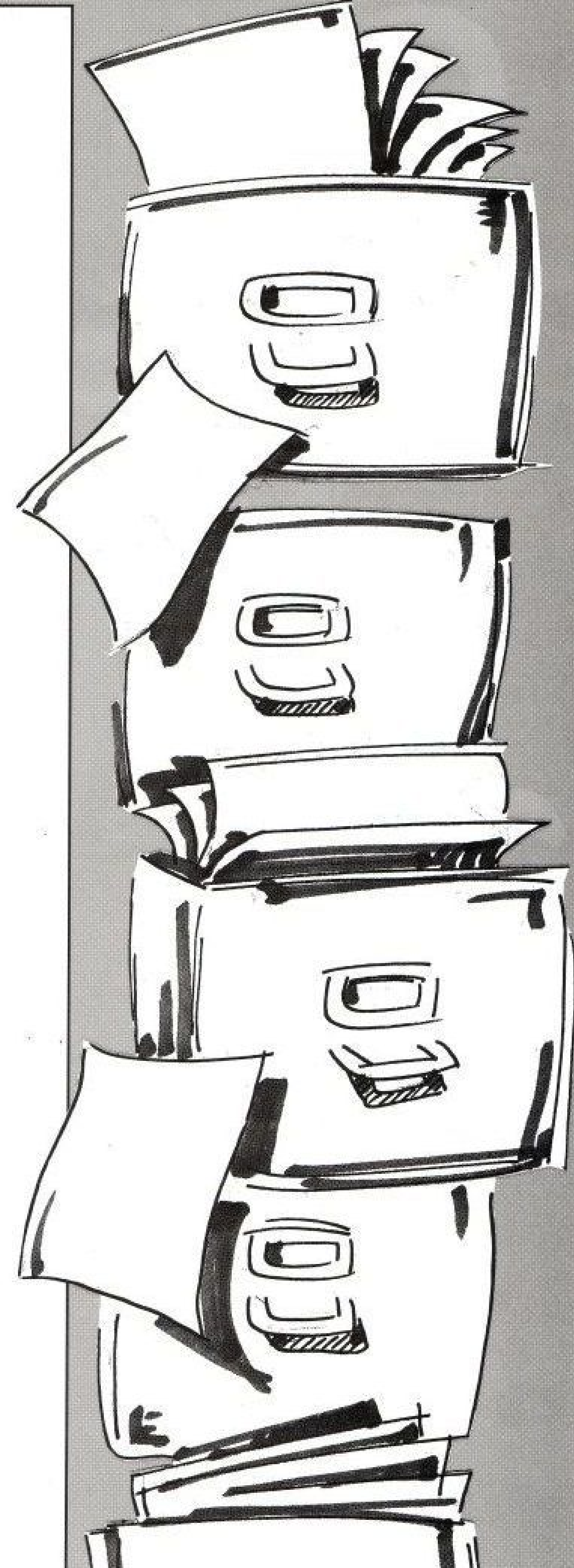
FOOTNOTE: The ruling body of motorcycling is the ACU – Auto-Cycle Union!





```
1260 LOCATE 8,23:PRINT SPACE$(66):IF UPPER$(in$)="S"THEN LOC
ATE 1,23:PRINT CHR$(18);TAB(33);"Searching Now":GOTO 1300 [5E
1270 IF UPPER$(in$)="C"THEN rn=i:GOTO 540 [D4]
1280 IF UPPER$(in$)<>"P"THEN RETURN [70] [70]
1290 PRINT#8,CHR$(27);"E";"Record :"i;CHR$(27);"F":PRINT#8:F
OR j=1 TO nf:PRINT#8,TAB(11-LEN(f$(j)));f$(j);" : ";:PRINT#8
,s$(i,j):NEXT j:PRINT#8:GOTO 1240 [BF]
1300 NEXT i:IF F4 THEN 990 [8C]
1310 LOCATE 1,23:PRINT"No matching records - press A to alte
r search parameters, any other key for menu" [4A]
1320 in$=UPPER$(INKEY$):IF in$=""THEN 1320 ELSE IF in$="A"TH
EN 820 [89]
1330 RETURN [6A]
1340 ' 93]
1350 '  Save File [96]
1360 ' [99]
1370 IF tr=0 THEN RETURN [CB]
1380 h$="SAVE FILE":GOSUB 1740 [C4]
1390 LOCATE 29,12:PRINT"Enter Filename: ";:LINE INPUT"",N$:W
HILE LEN(N$)>0:IF ASC(N$)=32 THEN N$=RIGHT$(N$,LEN(N$)-1:WEN
D [57]
1400 IF N$=""THEN 1390 [9A]
1420 GOSUB 1750:N$=UPPER$(N$):LOCATE 24,12:PRINT"Saving  ";N
$;" ... please wait":OPENOUT N$:PRINT#9,nf,tr,fl:FOR i=1 TO
nf:PRINT#9,f$(i):NEXT:FOR i=1 TO tr:FOR j=1 TO nf:PRINT#9,s$
(i,j):NEXT j,i:CLOSEOUT:RETURN [AF]
1430 ' [92]
1440 '  Load File [95]
1450 ' [98]
1460 h$="LOAD FILE":GOSUB 1740:IF tr=0 THEN 1520 [31]
1470 LOCATE 12,10:PRINT"WARNING - Loading a new file will de
stroy the current file.":LOCATE 25,12:PRINT"Do you wish to c
ontinue (Y/N)" [9E]
1480 in$=UPPER$(INKEY$):IF in$=""THEN 1480 [1C]
1490 IF in$="Y"THEN GOSUB 1740:GOTO 1520 [D5]
1500 IF in$<>"N"THEN 1480 [85
1510 RETURN [68]
1520 LOCATE 29,12:PRINT"Enter Filename: ";:LINE INPUT"",N$:W
HILE LEN(N$)>0:IF ASC(N$)=32 THEN N$=RIGHT$(N$,LEN(N$)-1):WE
ND [0B]
1530 IF N$=""THEN 1520 [3A]
1550 GOSUB 1750:N$=UPPER$(N$):LOCATE 24,12:PRINT"Loading  ";
N$;" ... please wait":OPENIN N$:INPUT#9,nf,tr,fl:FOR i=1 TO
nf:INPUT#9,f$(i):NEXT:FOR i=1 TO tr:FOR j=1 TO nf:LINE INPUT
#9,s$(i,j):NEXT j,i:CLOSEIN [45]
1560 F=0:FOR i=1 TO nf:IF LEN(f$(i))>F THEN F=LEN(f$(i)) [17]
1570 NEXT [0B]
1580 ru=INT(11-nf/2):tl=INT(39-(fl+F)/2):gu=408-ru*16:G=gu-(
nf+1)*16:gl=tl*8-16:gr=(tl+F+fl)*8+28:RETURN [3C]
1590 '       [A6]
1600 '  Information [8D]
1610 ' [90]
1620 h$="INFORMATION":GOSUB 1740:PRINT [51]
1630 PRINT"This is a general purpose filing program which al
lows the user to create files  of up to 400 records.  Each r
ecord may consist of up to 16 fields (i.e. Name,   Address e
tc) and each field may be up to 60 characters in length." [2B]
1640 PRINT"Field names and record contents may be altered at
 any time and whole files may  be saved to or loaded from di
sc." [27]
1650 PRINT"Files may be searched for records which match a s
pecified format and the         following conditions can be u
sed to assist in the search:":PRINT [1A]
1660 PRINT"  =name   will search for all entries which are t
he same as the specified entry   *name   will search for all
 entries ending in the specified entry                =name*
 will search for all entries begining with the specified ent
ry" [47]
1670 PRINT"  *name*  will search for all entries containing
the specified entry            <name   will search for all
 entries less than the specified entry              >name
 will search for all entries greater than the specified entr
y" [04]
1680 PRINT"        (these last two can be used in conjunction
 with  =  to                          provide searches for
entries >= or <= the specified entry).":PRINT [16]
1690 PRINT"If any of these are preceded with \ then they wil
l have the opposite effect to  that stated, so that \=name w
ill search for all entries which are different fromthe speci
fied entry." [4E]
1700 PRINT"Note that when no name is specified then any entr
y will match.":PRINT:PRINT TAB(24);CHR$(24);" PRESS ANY KEY
TO RETURN TO MENU ";CHR$(24):WHILE INKEY$="":WEND:RETURN [9C]
1710 ' [92]
1720 '  GOSUBS [95]
1730 ' [98]
1740 WINDOW 1,80,2,25:CLS:WINDOW 1,80,1,25:z=FRE(""):PEN 0:P
APER 1:LOCATE 1,1:PRINT TAB(36-(LEN(h$)/2));h$;TAB(53);"Free
:";z;TAB(69);USING"###";tr;:PRINT" Records ";:PEN 1:PAPER 0:
RETURN [D2]
1750 LOCATE 1,12:PRINT SPACE$(80):RETURN [67]
1760 LOCATE 1,20:PRINT" The length of the DATA you are enter
ing exceeds the MAXIMUM you have set":F0$=LEFT$(F0$,fl):PRIN
T:PRINT TAB(25);"PRESS ANY KEY TO CONTINUE":WHILE INKEY$="":
WEND:LOCATE 1,20:PRINT CHR$(18):LOCATE 1,22:PRINT CHR$(18):R
ETURN [EA]
1770 MOVE gl,G:DRAW gl,gu:DRAW gr,gu:DRAW gr,G:DRAW gl,G:MOV
E gl-1,G:DRAW gl-1,gu:MOVE gr+1,G:DRAW gr+1,gu:FOR k=1 TO 4:
MOVE gl+20,G-k:DRAW gr+k,G-k:DRAW gr+k,gu-20:NEXT:RETURN [36]
1780 ' [A7]
1790 '  Browse Files [AA]
```

```
1800 ' [91]
1810 IF tr=0 THEN RETURN [C3]
1820 h$="BROWSE FILES":GOSUB,1740:LOCATE 8,10:INPUT"Which re
cord number do you want to start from? <RETURN> for No 1 ",R
2:IF R2=0 THEN R2=1 ELSE IF R2>tr THEN R2=tr [56]
1830 GOSUB 1740:LOCATE 1,1:PRINT CHR$(24);" Record number ";
R2;CHR$(24):GOSUB 1770:FOR j=1 TO nf:LOCATE tl+(F-LEN(f$(j))
),ru+j:PRINT f$(j);" : ";s$(R2,j):NEXT:LOCATE 12,24 [EA]
1840 PRINT CHR$(240);" - Next Record   ";CHR$(241);" - Previ
ous Record   <SPACE> - Finish":WHILE INKEY$="":WEND:IF INKEY
(0)=0 THEN R2=R2+1 [8A]
1850 IF INKEY(2)=0 THEN R2=R2-1 [F6]
1860 IF INKEY(47)=0 THEN RETURN[EA]
1870 IF R2>tr THEN RETURN [F7]
1880 IF R2<1 THEN R2=tr [42]
1890 GOTO 1830 [B8]
1900 ' [93]
1910 '  Sort Records [96]
1920 ' [99]
1930 IF nf=0 THEN RETURN [1D]
1940 h$="SORT RECORDS":GOSUB 1740:FOR i=1 TO nf:LOCATE tl+(F
-LEN(f$(i))),ru+i:PRINT f$(i);" :";i:NEXT:GOSUB 1770:LOCATE
28,24:INPUT"Enter field to sort on  ",F3:LOCATE 30,24:PRINT
SPC(50):IF F3<1 OR F3>nf THEN F3=1 [0F]
1950 LOCATE 20,24:PRINT"Sort will be on field";F3;".... ";UP
PER$(f$(F3)):st=1:LOCATE 25,22:PRINT"Records to Sort..." [5C]
1960 TO$="ZZZ":FOR i=st TO tr:IF UPPER$(s$(i,F3))<TO$THEN TO
$=UPPER$(s$(i,F3)):M=i [21]
1970 NEXT i:LOCATE 45,22:PRINT USING"###";tr-st:LOCATE 53,1:
PRINT CHR$(24);"Free:";FRE(0);CHR$(24):FOR j=1 TO nf:TO$=s$(
st,j):s$(st,j)=s$(M,j):s$(M,j)=TO$:NEXT j:st=st+1:IF st=tr T
HEN RETURN ELSE 1960 [85]
1980 ' [AB]
1990 '  Print Records [AE]
2000 ' [82]
2010 IF nf=0 THEN RETURN [06]
2020 h$="PRINT RECORDS":GOSUB 1740:LOCATE 31,9:PRINT"File ha
s ";tr;" Records":LOCATE 13,12:INPUT"First Record ";R0:IF R0
<1 THEN R0=1 [48]
2030 LOCATE 53,12:INPUT"Last Record ";R1:IF R1>tr THEN R1=tr [07]
2040 IF R1<R0 THEN RETURN [4D]
2050 IF INP(&F500)<>30 THEN LOCATE 30,18:PRINT"Printer is no
t on line":FOR t=1 TO 2000:NEXT:RETURN [F]
2060 LOCATE 30,18:PRINT"     PRINTING NOW     ":PRINT#8,CHR$
(27);CHR$(79);:FOR i=R0 TO R1:PRINT#8,CHR$(27);"E";"Record :
";i;CHR$(27);"F":PRINT#8:FOR j=1 TO nf:PRINT#8,TAB(11-LEN(f$
(j)));f$(j);" : ";:PRINT#8,s$(i,j):NEXT j:PRINT#8:NEXT i:RET
URN [0C]
2070 ' [97]
2080 '  Tabulate Records [9A]
2090 ' [9D]
2100 IF tr=0 THEN RETURN [B3] [B3]
2110 h$="TABULATE RECORDS":GOSUB 1740:DIM S0(10),ml(10):B=1:
FOR i=1 TO nf:LOCATE 1,i+3:PRINT TAB(11-LEN(f$(i)));f$(i);"
- ";i:NEXT:LOCATE 22,4:PRINT"First Record to Print";TAB(52);
"Last Record to Print":LOCATE 46,4:INPUT"",F2 [7B]
2120 IF F2=0 THEN F2=1 ELSE IF F2>tr THEN 2340 [BA]
2130 LOCATE 45,4:PRINT USING"####";F2:LOCATE 76,4:INPUT"",L0
:IF L0=0 THEN L0=tr ELSE IF L0<F2 OR L0>tr THEN 2340 [9F]
2140 LOCATE 74,4:PRINT USING"####";L0:a=1:x=1:WHILE 1 [1]
2150 LOCATE 22,4+2*x:PRINT"Column Number";x;"Which Field ? "
;:INPUT"",a:a=INT(a):IF a>nf THEN 2150 ELSE IF a=0 THEN 2180 [E8]
2160 S0(x)=a:GOSUB 2350:LOCATE 55,4+2*x:PRINT"Max Length "US
ING"##";ml(x);:PRINT"  Total";B+ml(x):B=B+ml(x):ml(x)=B:x=x+
1:IF x=11 THEN 2180 [F4]
2170 WEND [5A]
2180 LOCATE 22,4+2*x:PRINT SPC(35):LOCATE 10,22:PRINT"Option
s:-  <A> Abort   <D> Discfile";:IF B<133 THEN PRINT"   <P> P
rinter"; [9C]
2190 IF B<80 THEN PRINT"   <S> Screen" [7D]
2200 i$=UPPER$(INKEY$):IF i$=""OR(i$<>"A"AND i$<>"D"AND i$<>
"P"AND i$<>"S")THEN 2200 [89]
2210 IF i$="A"THEN 2340 [DE]
2220 IF i$="S"THEN IF B>80 THEN 2200 ELSE a=0:GOSUB 1740:LOC
ATE 1,2 [55]
2230 IF i$="P"THEN IF B>132 THEN 2200 ELSE a=8 [C]
2240 IF i$="D"THEN a=9:LOCATE 25,24:INPUT"Name of Discfile "
;fi$:OPENOUT fi$ [20]
2250 IF a=8 AND INP(&F500)<>30 THEN LOCATE 30,25:PRINT"Print
er is not on line":FOR t=1 TO 2000:NEXT:LOCATE 30,25:PRINT S
PC(22):GOTO 2200 [13]
2260 IF a=8 THEN LOCATE 35,25:PRINT"Printing Now" [98]
2270 IF a=8 AND B>80 THEN PRINT#a,CHR$(15); [B8]
2280 IF a=8 AND B<=80 THEN PRINT#8,CHR$(27);"E"; [BE]
2290 WINDOW 1,80,2,25:PRINT#a,STRING$(B,45):PRINT#a,"¦ ";:x=
1:WHILE S0(x)>0:PRINT#a,UPPER$(f$(S0(x)));TAB(ml(x));"¦ ";:x
=x+1:WEND:PRINT#a:PRINT#a,STRING$(B,45):FOR i=F2 TO L0:PRINT
#a,"¦ ";:x=1:WHILE S0(x)>0:PRINT#a,s$(i,S0(x));TAB(ml(x));"¦
 "; [8A]
2300 x=x+1:WEND:PRINT#a:NEXT i:PRINT#a,STRING$(B,45):IF a=0
THEN CALL &BB18 [56]
2310 IF a=8 AND B>80 THEN PRINT#a,CHR$(18); [23]
2320 IF a=8 AND B<=80 THEN PRINT#8,CHR$(27);"F"; [DC]
2330 IF a=9 THEN CLOSEOUT [56]
2340 ERASE S0,ml:RETURN [88]
2350 FOR i=F2 TO L0:IF LEN(s$(i,a))>ml(x)THEN ml(x)=LEN(s$(i
,a)) [A4]
2360 NEXT:IF LEN(f$(a))>ml(x)THEN ml(x)=LEN(f$(a)) [F0]
2370 ml(x)=ml(x)+3:RETURN[49]
2380 ' [A0]
2390 '  End Program [A3]
2400 ' [8A]
2410 KEY 139,CHR$(13):CLS:CALL &BC02 [40]
```



Going off the rails



The Doc gets his wires in a twist, tunes in to Teletext, and teaches the CPC to count up to eight, all in glorious livid Technicolour.

I assume you've all heard the one that's going the rounds at the moment?? It's the old 'How many programmers does it take to change a light bulb?' saw. My answer was 'None - it's a hardware problem', but it seems I'm wrong. The answer is 'Six - one to screw it in, and five to tell him how they could do it better!' [giggle]

Ah. well, enough of this levity, on with the serious stuff at hand. Our fist letter concerns a hardware problem (and you thought the first paragraph was just gratuitous jokery). From Orpington in Kent, Andrew Gallon writes:

'I have recently purchased the Advanced Art Studio from Rainbird and now wish to print out in colour, so please could you advise me of a suitable printer for a reasonable price which will make good use of colour?

In the August '90 edition of ACU,

MJC supplies advertised Colourdump 2 for printing on a Star LC10C. Is this really necessary, and if so what is it?

As I am an electronic cretin, do you also need an interface etc. for its use on my CPC6128?'

Reasonable price, Andrew?? For the life of me I can't define that at all - what's reasonable to you might be outlandish to someone else. However, what I can do is point you in a couple of directions.

Firstly, the Star LC10C. It's an excellent little printer that will do the job just fine. It's available at a VERY reasonable £150 if you shop around, and is probably the most popular colour printer for the CPC range. This implies that it's also the best supported, which is, indeed, the case. Quite honestly, I'd suggest you look no further, unless 'reasonable' encompasses a fair wedge of dosh.

If that's the case, the Star XB24 range is also excellent – 24 pin printers with colour options and multiple fonts. I've played with one for a while, and was most impressed with it – it's not only fast, but prints beautifully, and, above all, quietly.

As for Colourdump 2 – this is an excellent utility that is capable of driving the LC10C to print out the closest approximation to what you see onscreen that I've come across. As you may recall from the mists of time, the LC10C, like all of its ilk, has only three colours to print with, plus black. This gives it a colour mixing potential of eight colours. Not exactly awe inspiring, is it??

Colourdump 2 manages, via some clever dithering techniques, to give the impression that the printer is churning out many more than that. So, whilst it's not a vital bit of kit, I'd advise you to grit your teeth and spend the money on it.

Oh, and, no, you don't need another interface – you've already got a perfectly serviceable parallel port on your machine. You'll get more out of it if you attach an 8 bit printer port to it, but, again, it's not strictly necessary.

More Hardware – Page the Oracle

More hardware related stuff from the pen of Mike Wood:

'I want to turn to teletext. I wonder if you could tell me where I could find the equipment needed. I have a 464.

Also, I won a Multiface 2 and would like to know if the insider program advertised is on tape. I would be grateful if you could help.'

Short and sweet, Mike. For the Teletext gear, Microtext is the place to go. Call them on 0705 595694, and tell em we sent you. As far as insider is concerned, it's available only on disc, I'm afraid.

NOjoy stick

Strangely enough, the next one's a hardware problem too! What's the matter?? Is everyone managing all the software OK now??

D Jaggard, a fourteen year old with no Christian name writes:

'About a year ago I bought a Cheetah 125 Special for my 6128. Today I just finished building my Joystick splitter to go with it. This works fine with two separate joysticks but when I try to plug my Cheetah into it I can't get the special stuff to work. I try peeking the address in the joystick handbook, but it doesn't get me anywhere.

Is there a problem with my splitter or my joystick? I don't want to send it back because I opened it up to realign the trigger button. Can you help?'

Well, D. (I CAN call you D, can't I?) you've really answered your own question. The diagram you sent me looks perfectly OK, and, if you have success with two normal joysticks, it's reasonable to assume that the problem lies with your Cheetah Special.

It's my guess that its internal gubbins doesn't like splitters, so you will need to get in touch with Cheetah themselves, and, probably, return the stick to them for any faults to be rectified – the price of getting stuck in with the soldering iron yourself, I'm afraid.

Binary Trainspotting

Peter Wilson is next up, all the way from Cornwall (OK, Chris, you can get the hanky out for a big crying session now!). He wordprocesses:

'I would like some help regarding Amstrad CPC computers, and would be grateful if you or your readers could help me.

I have had my Amstrad CPC6128 for about 5 years now, and I have been delighted with its ability and value for money.

Recently I was set a task by a friend of mine to design and build a signalling system for his large garden railway. As the system is required to work fully automatically most of the time, and some of the logic is quite complicated, it seemed like a good idea to use a small computer.

I have written sufficient of the software (in BASIC) to know that the Amstrad will do what is necessary of it but I am having great difficulty in obtaining any suitable interfaces to go between the computer and the relays that are driving the signalling system.

The system requires about 20 inputs and 30 outputs, although room for expansion would be useful.

There must be hundreds of applications for an Amstrad to control various devices for the hobbyist and also for home automation but as yet I have not been able to find anyone that manufactures a suitable interface, or even knows how to build one.

If anyone can help me find a suitable interface I would be very grateful if they would contact me direct, or through ACU.'

This one is NOT easy, Peter. CPC I/O address ports are severely limited – I know of I/O adapters that allow up to eight ports to be used – from Maplins, but I know of nothing at all that will allow for the fifty or more ports you require.

However, it ought to be possible, with a little thought and cunning design, to utilise eight bit ports to give up to 64 possible control lines, both directions. As I understand it, A/D ports, and D/D ports all use bitwise operations to carry information, meaning that there are 128 possible states for the eight ports at any given time (as each bit can be on or off, active or not).

The problem, it seems to me, lies in the loom logic applied to the signalling system – that is to say that each signal will need a small logic circuit attached to it to accept only a specific signal being output from the interface, with reverse logic applied from the sensors.

That's about as far as I can take it without a great deal of help - this kind of application of A/D and D/D ports is a terrifically specialist field.

So, for the first time this year, I'm stumped!! Can anyone out there help?? Any thoughts will be welcomed, and if Peter can get the project running, I'm sure ACU will be only too happy to do a feature on it, with suitable plugs for the parties concerned in helping with it!

I'll happily pass on any information you care to send, and can make over a small corner of this column to it as an ongoing project – it could be quite exciting!!

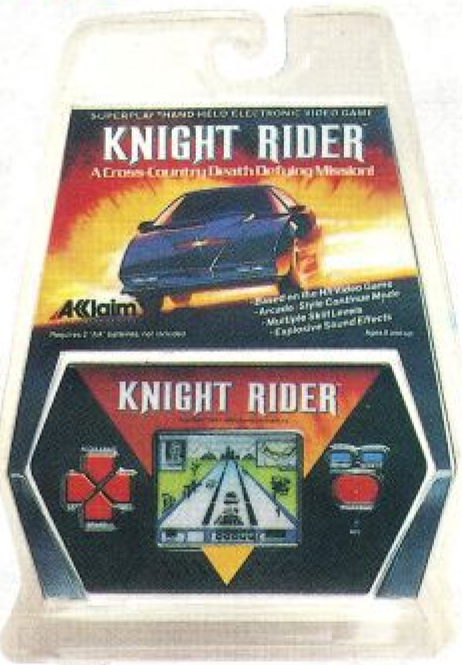
And that about wraps it up for this month. My bruvver Gordon's just given me a copy of a new ANSI terminal emulation for the CPC, so I'm going to bung it onto my hard disc and give it a whirl. See you next month – don't forget to write!!

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Proton Software 72
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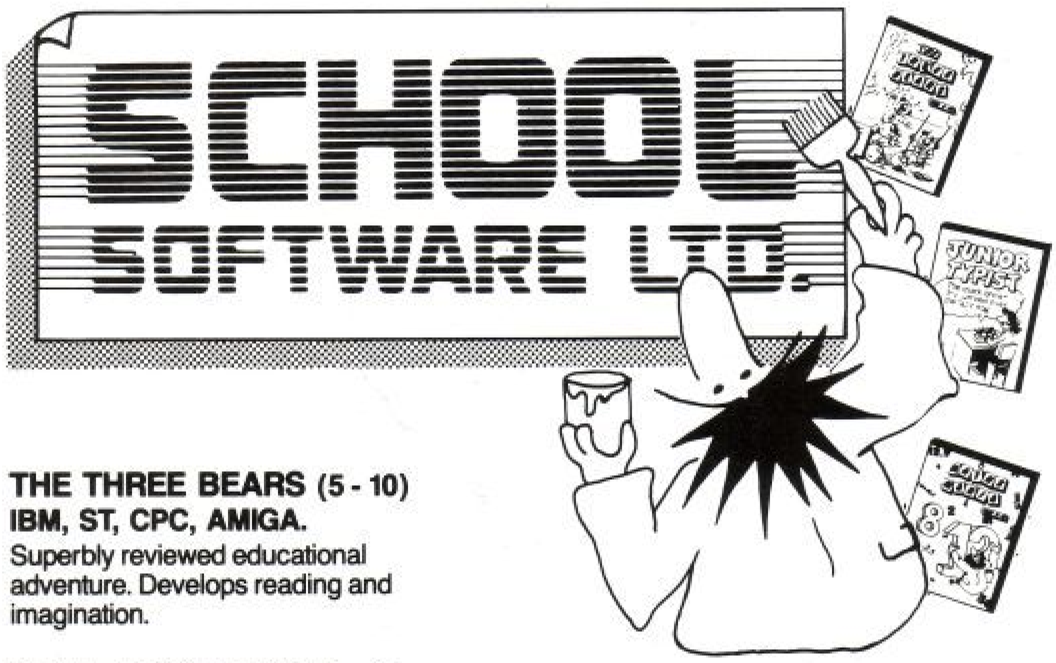
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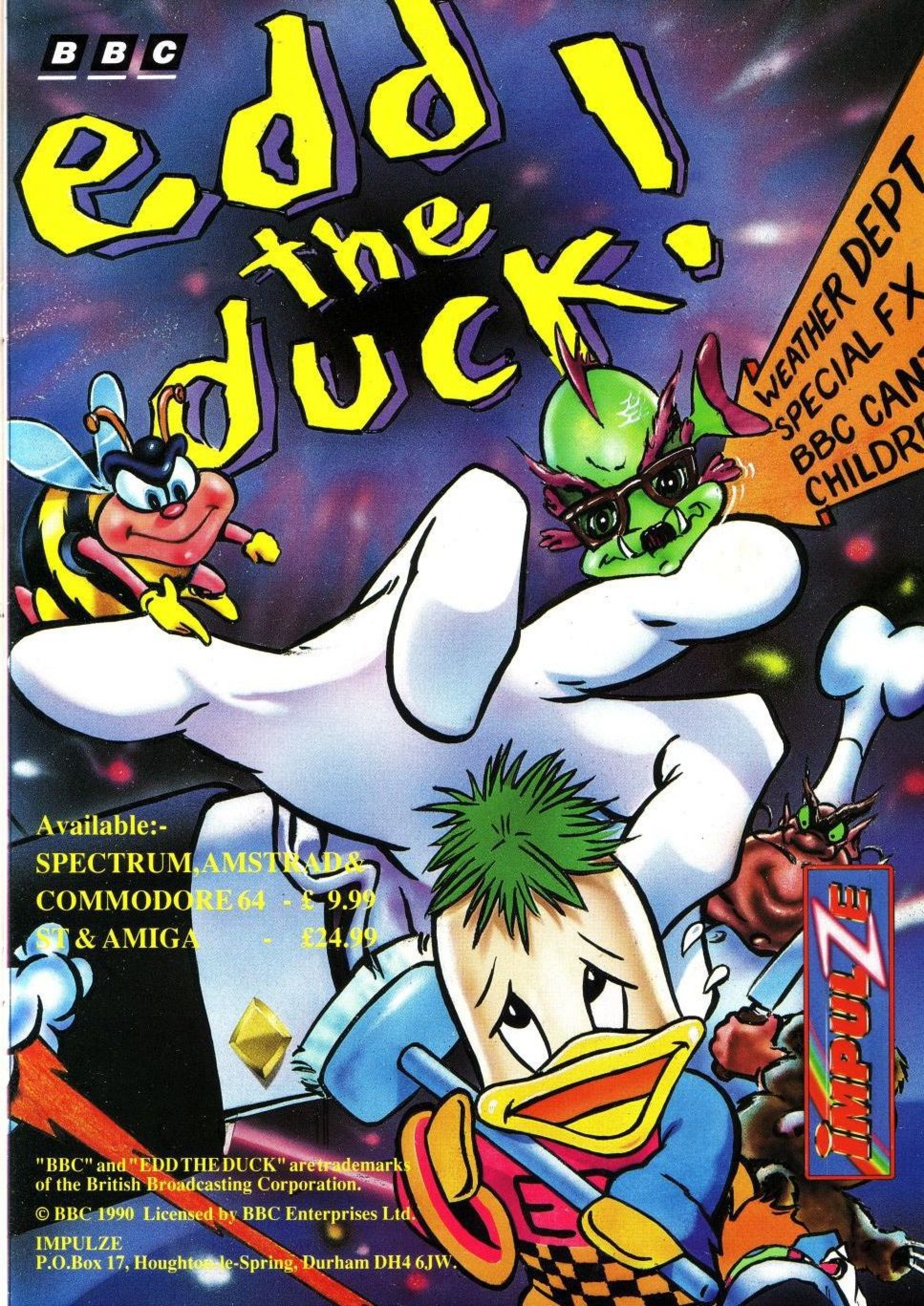
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